



25 years Netherlands Commission for
Environmental Assessment

Myanmar (DRIVE)

Advice on the scoping / ToR for the Passenger Transport Chindwin River



26 June 2020
Ref: 7273



Advice of the Secretariat

Title	Advice on the scoping / ToR for the Passenger Transport Chindwin River, Myanmar
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Cover photo	Chindwin river at Monywa by Richard Weil / CC BY-ND 2.0
Reference	7273

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List of Acronyms

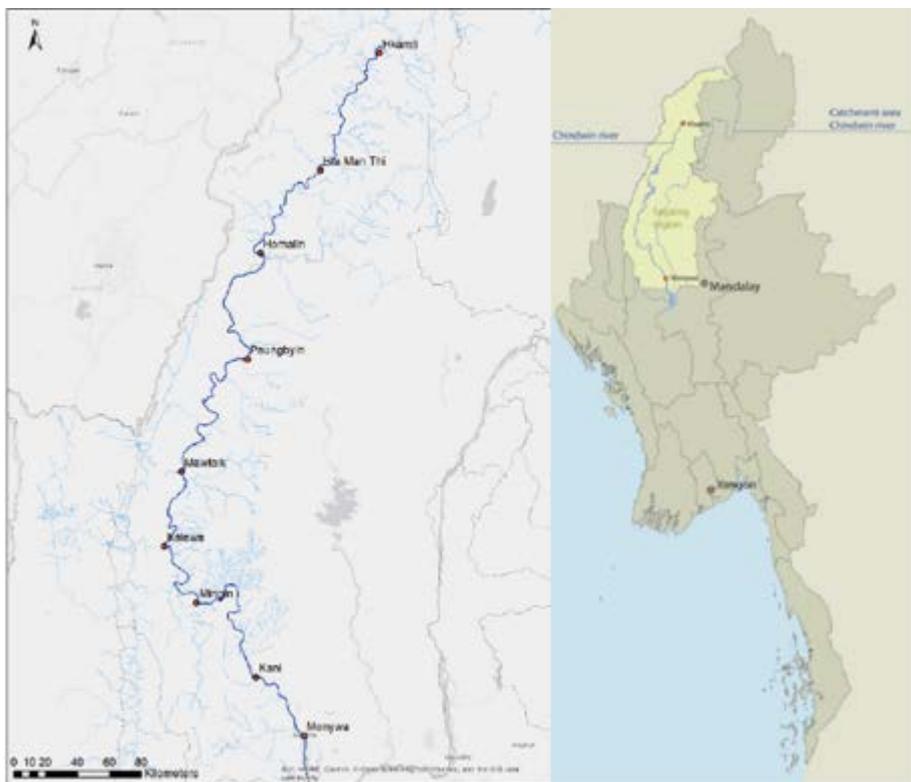
CSO:	Civil Society Organisation
DACU:	Development Assistance Coordination Unit
DMA:	Department of Marine Administration
DRIVE:	Development Related Infrastructure Investment Vehicle
DWIR:	Directorate of Water Resources Improvement
ECD:	Environment Conservation Department
ESIA:	Environmental and Social Impact Assessment
ESMP:	Environmental and Social Management Plan
EHS:	World Bank Group Environmental Health Safety Guidelines
FPIC:	Free Prior Informed Consent
FRP:	Fibre Reinforced Plastic
GoM:	Government of Myanmar
IEE:	Initial Environmental Examination
IFC PS:	International Finance Corporation Performance Standards
IMO:	International Maritime Organisation
IWT:	Inland Water Transport
LRP:	Livelihood Restoration Plan
NCEA:	Netherlands Commission for Environmental Assessment
RAP:	Resettlement Action Plan
RHDHV:	Royal HaskoningDHV
RVO:	Netherlands Enterprise Agency
SEP:	Stakeholder Engagement Plan
ToR:	Terms of Reference

1. Introduction

1.1 The Project

Chindwin River is the largest tributary of the Ayeyarwady and it has long been an important mode of transport in the Sagaing Region in Myanmar. In the past few years, several deadly disasters have occurred in private sector operated river transportation. Also, the river has become very shallow in the dry season due to an increase in sediment loads, which is attributed to upstream mining and deforestation. This poses a constraint to the Inland Water Transport (IWT) to operate their boats in the dry season¹. IWT is a state-owned enterprise under the Ministry of Transport and Communications and is responsible for passenger and cargo river transportation in Myanmar.

IWT is currently preparing a project to *develop year-round safe and reliable transport* through the introduction and operation of a series of shallow draft passenger ferries, the establishment of adequate mooring for these ferries and hotspot dredging. The project is called 'Passenger Transport Chindwin River' in Myanmar (from now on 'the project') and is proposed by the IWT ('the proponent'). The project is located in the Sagaing Region and runs 700 km along Chindwin River's bed, from Hkmati in the North, to the confluence with the Ayeyarwady River in the South. The project will replace IWT's present ferry service with a new intercity ferry service, to connect the towns Monywa, Mingin, Kani, Kalewa, Mawlaik, Paungbyin, Homalin, Hta Man Thi and Hkmati.



Source: Revised Scoping report Passenger Transport Chindwin River, June 2020

¹ It is unclear to what degree private sector operated boats face the same problem. In the scoping report (Annex C minutes of a meeting with the IWT) it is stated that the private sector makes use of smaller boats that run all seasons.

The proposed components of the project are:

1. **The construction and maintenance of jetties.** The project will install floating multihull pontoons and a flexible bridge as jetties at 9 landing sites.
2. **Constructing the hulls for the new ferries** (outside Myanmar). The ferries will be constructed in Fibre-Reinforced Plastic (FRP) fibre-glass with the following specifications: 24-meter long, 7 meters beam, 1-meter draught, maximum speed at 15 knots and capacity of 120 passengers. For the purchase of the ferries, the Government of Myanmar (GoM) will acquire a loan.
3. **Upgrading IWT's Dala and Monywa shipyards** to be able to assemble and maintain the new ferries. An **assembly and maintenance of the 9 ferries** will be done at the IWT Dala shipyard in Yangon. Small repairs will be done at the Monywa shipyard.
4. **Annual hotspot dredging²** at shallow parts of the Chindwin river in the dry season.

The project is currently in the development phase and is receiving support from the Netherlands Enterprise Agency (RVO) under the Develop2Build facility. After the project is approved, which depends among others on the outcomes of the ongoing Environmental and Social Impact Assessment (ESIA), the RVO intends to finance the construction of the landing sites for the ferries and the upgrade of the Monywa and Dala Shipyards under its DRIVE facility. The dredging activities are not planned to be part of the scope of the DRIVE project and remain under the responsibility of Myanmar's Directorate of Water Resources and Improvement (DWIR). However, because they are considered to be a crucial component for the project to proceed, dredging activities are included in the scope of the ESIA.

A team of consultants from RHDHV and Environment (Wuynkin) Myanmar Cooperative Ltd. (EMC) is responsible for the ESIA. This team has delivered a scoping report for the ESIA on February 2020, and a subsequent revised version on June 2020. As per local requirements, GoM projects that intend to acquire a loan, need approval from the Development Assistance Coordination Unit (DACU) and from the Parliament. DACU has already approved the project, but the project still has to pass Parliament. In May 2020, the Environment and Conservation Department (ECD) provided their screening result to the IWT and they require an Initial Environmental Examination (IEE) for this project.

The Netherlands Commission for Environmental Assessment (NCEA) received a request from the RVO to carry out an independent quality review of the aforementioned scoping report. The NCEA's review advice will be used to inform the ESIA work that is planned between May and August of 2020 (tentatively).

1.2 NCEA's Approach

To carry out the review, the NCEA assembled a working group of experts covering the fields of marine ecology and dredging, biodiversity, river transportation safety and socio-economic impacts. Initially, the NCEA's review concentrated on the scoping report of **February 2020**. Upon receipt of the NCEA's draft advice, the RVO concluded that the information that had been provided for review was not a complete representation of the assessment work done so far. Subsequently, the ESIA team updated the scoping report, adding relevant information and

² Capital dredging refers to the removal of previously undisturbed sediment or rock layers, while hotspot dredging involves the periodic removal of sediments and shoals from existing navigation channels, berths and so on.

clarifications³. A revised scoping report dated **5 June 2020**, was submitted to the NCEA and this document has been the subject of the review in this final advisory report. The working group also made use of other project related documents (e.g. the inception report, the feasibility study report and the dredging study). The NCEA did not evaluate the quality of these documents, but drew additional information or background from them where needed. Due to the travel restrictions related to COVID-19, the working group was not able to visit the project location. The findings and recommendations this advice are hence only based on what has been recorded in the scoping report of June 2020. The working group reviewed the scoping report with reference to the following benchmarks:

- The Myanmar EIA Procedure (2015)
- The International Finance Corporation Performance Standards (IFC PS)
- World Bank Group Environmental Health and Safety Guidelines (EHS) including:
 - General EHS Guidelines (2007)
 - EHS Ports, Harbors and Terminals (2017)
 - EHS Shipping (2007)
- Other relevant international standards used include:
 - International Maritime Organisation (IMO) International Convention for Safety of Life at Sea (SOLAS) 1974 as amended
 - International Maritime Organisation International Code for Application of Fire Test Procedures, 2012
 - EU Directive 2009/45/EC of 6-5-2009 on Safety rules and standards of passenger ships

On principle, the NCEA aims to inform the local environmental authority of their review work, so that both institutions can exchange information and experience during their respective reviews. However, because the ECD has concluded that an IEE is required (not a full EIA) for the project, and because the IEE does not include a formal approval of a scoping report, the NCEA did not connect with the ECD for exchange purposes. The NCEA will be informing the ECD of this advisory report once published.

The following chapter (Chapter 2) first gives a summary of key findings and conclusions. In Chapter 3, these key findings are elaborated in detail, with reference to IFC PS where relevant. In Chapter 4, several *additional and detailed points of attention* in relation to IFC PS are outlined, which have not yet been touched upon in the earlier chapters, but which do need to be addressed in further steps of the scoping/ESIA.

³ The additional information included among others a further explanation on the project rationale. Two key modifications to the project proposal were also clarified 1) the change in the proposed use of the ferries from simultaneous carriage of passengers and fuel and cargo to exclusive use for passenger transportation and 2) the change in use of pontoon jetties from dual use as passenger embarkation/disembarkation facility and storage of fuel for commercial purposes to exclusive use of passengers.

2. Summary of key findings and conclusions

The scoping report (June 2020⁴) shows that a serious effort has been expended in the first stage of the ESIA for this project. The report presents useful information to inform further design of the project, as well as the remaining ESIA work.

- The revised scoping report gives a clear project justification (i.e. the proposed investment in river-based transport and the objective of delivering a safe ferry service).
- Different project components have been described and institutional stakeholders consulted.
- There is a good description of the towns in the project area and the current situation at the landing sites.
- Relevant background studies have been carried out that informed the scoping process.

The proposed project could bring benefits to local people in the Sagaing region by creating improved river transport facilities and services and improved working conditions for staff at the shipyards and ferries. The general conclusion drawn in the scoping report is that no potential significant impacts and risks are expected from the proposed project. This is probably correct for activities like the upgrading of the shipyards and the construction and maintenance of the jetties and the ferries themselves. But that conclusion does not seem justified for dredging in the Chindwin River or for the proposed ferry type because:

- Even relatively small amount of dredging could already disturb the river system and cause significant (and at times possibly irreversible) impacts on to biodiversity, fishery resources and river morphology. The dredging locations and volumes will vary annually, which complicates the generalization on impacts. Any conclusions on impacts need to be based on detailed data gathering and analysis concerning the project area and dredging locations. Moreover, as dredging is not part of the project scope, possibilities to consider alternatives seem to be limited and the follow up of mitigation measures are uncertain.
- Chindwin already has a disturbed morphology in some sections, with increasing levels of flooding and riverbank erosion as consequences. Dredging may reinforce this situation.
- Conventional Fibre-Reinforced Plastic (FRP) materials are vulnerable to fire and lose their strength quickly at relatively low temperatures. The related safety risks specific to the project location need to be explored and understood. If the institutional capacity to manage the safety of the proposed ferries is not adequately addressed, safety concerns in river transport will remain.
- The conclusions about the level of impacts, both related to dredging, the proposed ferry types and other activities introduced by the project, do not yet take concerns of affected stakeholder into account, as these stakeholders are still to be identified and engaged.

Key recommendations:

The ongoing ESIA work could help avoiding, mitigating and managing potential impacts through the following:

- The impacts on biodiversity, fisheries, river morphology and safety risks related to the proposed project are assessed and presented.
- Alternatives are identified, assessed and presented, in order to justify:
 - Why dredging cannot be avoided
 - Why certain dredging equipment and disposal methods are preferred

⁴ Throughout this advisory report we will refer to the scoping report of June 5th 2020 as “the scoping report”.

- Why a certain type of ferry (and jetties) is proposed
- Risks associated with FRP ferries are assessed and alternatives (such as upgraded versions of existing ferries or Steel Hull Ferries) to inform the project's design and safety management plans. Information on the proven design is presented in the ESIA.
- Institutional arrangements are made with, and adequate support is provided to, DWIR to implement the mitigation measures and management plans formulated in the ESIA.
- The impacts identified in the ESIA are monitored in collaboration with stakeholders and impacts are addressed through adaptive management.
- Institutional, human and financial conditions to deal with safety are put in place.
- Stakeholders are identified and effectively engaged throughout all phases of the project.

3. Elaboration of key findings and recommendations

3.1 Dredging & potential impacts

In the scoping report, it is recognized that dredging is an activity with potential impacts on biodiversity and fisheries amongst others. The ESIA team will consider these impacts in the more detailed ESIA work. The information throughout the scoping report and additional information received from the ESIA team indicate that impacts from dredging are expected to be limited because the river water itself is already quite turbid and dredging volumes will be small. The NCEA is of the opinion that these conclusions are premature, because a more detailed impact assessment is still to be carried out. Moreover:

- Even relatively small-scale dredging activities could cause significant impacts at locations with a sensitive receptor. Especially when there are cumulative impacts in combination with other developments (e.g. overfishing, pollution, illegal trade in wildlife and so on). It is unclear whether the project could interfere with other development priorities in the area concerning for instance fisheries, wetland development or nature conservation.
- Increasing the turbidity in river water that is already turbid, does not automatically imply there will be no impacts. Again, this will depend on the presence of a sensitive receptor.
- Several uncertainties complicate the prediction and management of impacts:
 - Locations and volumes for dredging and disposal will differ every year.
 - Each year, there is limited time to study and prepare the dredging works, given the changes in seasons. Collecting and integrating environmental/social data in dredging plans will therefore be a challenge.
 - DWIR's financial, technical and institutional capacity to implement dredging activities, mitigation plans and measures in line with international standards, may need to be assessed.

In the coming sub-sections, potential impacts from dredging on biodiversity, fishery resources and river morphology are elaborated, and recommendations are provided for the further stages of the ESIA.

3.1.1 Biodiversity

The Chindwin River Basin is rich in biodiversity values (see Annex 1). River transport could be a way to prevent disturbance to its key biodiversity areas. But negative impacts may also be associated with it, particularly in relation to dredging. The scoping report states that

potential impacts on biodiversity will be studied and guidelines will be prepared to reduce dredging impacts. The following points of attention have to be considered:

- **Avoid measurable impacts on critical habitats and globally threatened species.** The project location probably contains *natural and critical habitats* as defined by IFC PS 6⁵. The first two proposed dredging sites are directly located in nesting sites of the critically endangered Burmese Roofed Turtle: these are probably among the last remaining habitat of these species. As will be outlined later, it may turn out that dredging activities need to take place in habitats of other endangered or endemic species as well: this information is still to be determined in the further ESIA process⁶.
- **IFC PS 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources** requires that avoiding impacts on biodiversity should have priority. Moreover, this standard (in particular sub 13–19 referring to natural and critical habitats) puts significant demands on proponents by requiring the following:
 - In natural habitats, measures will be taken to ensure no-net loss on biodiversity where feasible
 - No project activities should be implemented in critical habitats unless no viable alternatives exist
 - The project may not lead to measurable impacts on the critical habitat or a net reduction of (critically) endangered species. A Biodiversity Action Plan must be formulated for critical habitats, including the design of a biodiversity offset and a net gain in critical habitats.
 - Arrangements need to be made for the adaptive management⁷ of impacts on biodiversity
- In the scoping report, efforts are planned to **reduce impacts from hotspot dredging in sensitive and valuable habitats**. The following can be remarked:
 - The IFC PS emphasize the need to avoid impacts as much as possible. To enable avoidance and minimizing impacts, first step is to identify areas of natural and critical habitats used by aquatic life for feeding, breeding and migration. Then, baseline data need to be collected on these areas and the species prioritized for conservation⁸.
 - The impact assessment needs to consider finding ways to avoid dredging and disposal of dredging materials in critical habitats. For instance, through the consideration of alternatives for the proposed dredging and disposal methods (see section 3.3).
 - The scoping report mentions that ecological seasons will be analyzed to see if the timing of the dredging activities can be optimized to limit impacts. However, the dredging study also suggest that major changes in timing of dredging are not feasible

⁵ Defined as areas with high biodiversity value containing habitat of (critically) endangered and/or endemic species as per IUCN's Red list. The presence of various endangered and endemic species imply the presence of critical habitats in the project location.

⁶ The high biodiversity value and the presence of endangered or endemic species implies that the project contains critical habitats, as these are among the criteria to classify as critical habitat.

⁷ IFC PS 6 (ad 7) explain that impacts on biodiversity may be difficult to predict. Therefore, adaptive management is required, meaning that mitigation and management measures need to be responsive to changing conditions and monitoring results on clear performance thresholds.

⁸ As described in the EHS Guidelines for Ports and Harbors. In addition, IFC PS 6 (Guiding Note) requires that baseline data should be collected at least during two seasons (wet and dry). In case of natural/critical habitats data need to be collected over multiple seasons, with involvement from external experts.

(understood as: making sure there is no need to return for another round of dredging in the same year). It needs to be made explicit in the ESIA where and how adaptations in the timing of dredging could avoid impacts on critical habitats ⁹.

- Before the impact assessment, it should be clear what methodologies, parameters and criteria for evaluation will be used to determine the significance of impacts.
 - Mitigation measures proposed need to be realistic and monitored. Creating new sanctuaries may not be successful for highly sensitive species like freshwater turtles ¹⁰.
- **Complete the list of globally threatened species.** A survey is planned to get a full overview of species that could be impacted by the project. Before the assessment starts, it should be clear which species specific to the project's affected area will be included in the impact assessment and the ESMP. When surveying and selecting species for further consideration, bear in mind that:
 - Next to the Burmese Roofed Turtle, also other endangered species and their habitats could also be impacted. The NCEA would like to highlight that species listed in Table 1. living in or near the Chindwin river would also be highly vulnerable to activities like dredging and changes in the river morphology.

Table 1.

Species	IUCN red list category
Smooth-coated Otter	Vulnerable
Small-clawed Otter	Vulnerable
Hairy-nosed Otter	Endangered
Black-bellied Tern	Endangered
Fishing Cat	Vulnerable
Black-necked Stork	Near threatened
Indian Skimmer ¹¹	Vulnerable
Burmese Peacock Softshell Turtle	Endangered
River Lapwing	Near Threatened
Masked Finfoot	Endangered
Great Thick Knee	Near Threatened
River Tern ¹²	Near Threatened
Spot-billed Pelican	Near Threatened
Oriental Darter	Near Threatened

- Other species living in the Chindwin River to consider are:
 Several endemic fish including newly described *Cyprinid puntius padamya*
 Small Pratincole, which is a characteristic bird of the Chindwin river potentially fulfilling several criteria for designation of certain river stretches as Ramsar sites

⁹ EHS Guidelines on Ports and Harbors (2017) prescribe that the timing of dredging activities should consider seasonal factors such as migration periods, breeding and growing seasons.

¹⁰ So far conservation activities of Burmese Roofed Turtle focused on site protection. To establish a new sanctuary, there is need to understand the entire ecology and lifecycle of the turtle throughout all seasons. Any movement or re-establishment would bring a risk to the species.

¹¹ At the time of this review, the REDlist status of Indian Skimmer was being reviewed and the result is expected in July 2020. It is expected that its status will be upgraded to Endangered.

¹² At the time of this review, the REDlist status of the River Tern was being reviewed and the result is expected in July 2020. It is expected that its status will be upgraded to Vulnerable.

Burmese Narrow-headed Softshell Turtle is also reported to be critically endangered¹³
It is likely that the Chindwin River hosts several globally threatened fish species¹⁴

- Globally threatened bird and mammal species living along the river and its sandbanks may also be impacted.

3.1.2 Fisheries

The scoping report on different towns makes clear that fisheries are an important source of livelihood and employment to people along almost the whole river¹⁵. Dredging activities could affect (some) of these small-scale and leasehold fishers as a result of a reduced access to fishing grounds, or a drop in fish stocks due to changes in water quality or river bathymetry. **IFC PS 6** requires that when a project is likely to adversely impact ecosystem services, a systematic review is done with stakeholders of priority ecosystem services. **IFC PS 4 and 5** consider impacts resulting from the loss of eco-system services as economic displacement, requiring appropriate compensation and/or livelihood restoration. The further ESIA needs to explore and present the potential magnitude of the impacts on fishery resources and the loss of livelihoods. In the scoping report, potential impacts on fisheries are recognized and further investigation is announced. In these investigations, the following requires specific attention.

- **Specify priority fish species to be considered for protection.** For a more focused study and managing impacts, it would be useful to prioritize the fish species that are important to local people. Such prioritization should be done in consultation with stakeholders that could be potentially affected.
- **Specify potentially affected stakeholders and their continuous engagement.** The project is taking place along a 700km river stretch and dredging and disposal locations and times will vary yearly. These activities need to take place in a very short timeframe, posing challenges to identifying locations where dredging could harm fisheries resources and to engaging stakeholders. There is a risk that impacts on vulnerable groups will be overlooked. The ESIA should clarify how the project is required to deal with this challenge for stakeholder engagement during implementation.
- **Outline how impacts on fishery resources and on livelihoods will be avoided, mitigated or compensated.** Bear in mind that the need for compensating fishers could have significant (financial) consequences for the project. In the implementation phase, it will be important that the relevant government institutions are able to identify and to avoid such impacts and that arrangements will be put in place for the appropriate compensation/livelihood restoration support in case of (temporary) impacts on fishers.

¹³ Platt, S., Platt K. 2016. A challenging year in the fight to save Myanmar's critically endangered turtles. *Turtle Survival* 2016; 34-38

¹⁴ Chindwin hosts more than 300 fish species and a list of fish species is given in (Zöckler & Kottelat (2017) SOBA 4.5 Bio-diversity of the Ayeyarwady Basin. Updated in 2018). Another study on the Ayeyarwady river lists 550 fish species in the main river, of which 29 are globally threatened (2 critically endangered, 7 endangered and 20 vulnerable) (see Kottelat M., (2017) Fish diversity in the Ayeyarwady Basin. Report for Flora and Fauna International and WorldFish. Unpublished Shed). It is likely that the Chindwin River hosts a similar number of globally threatened fish species.

¹⁵ Sections 5.3 and 5.4 of the scoping report illustrate the importance of fisheries as a source of livelihood and employment in towns like Monywa, Phaungbuin, Mawlaik, Mingin and villages like Kin Tat, Nant Sa Li, Zee Khone and Kyan. The economic role of species like *Sardinella Razorbelly Minnow*, and valuable catfish species are also highlighted. Next to small scale fishers, 300-400 leasehold fishers are reported to be present in the area.

Preparing the yearly dredging works

From the scoping report, it is understood that a monitoring system will be set up and the bathymetry surveyed yearly to detect hotspots and bottlenecks in the Chindwin's navigation channel. These hotspots will then be surveyed to prepare the dredging works. The ESIA team will deliver a framework for this yearly survey and for preparing dredging. In the final ESIA, it needs to be specified what this framework and its implementation will entail:

- Outline how the prediction, avoidance and monitoring of impacts on biodiversity and fisheries shall be integrated in the yearly dredging plans and activities.
- Specify the requirements for the yearly surveys (e.g. length, survey methods, timing) and parameters to be studied. Ensure that these surveys look into the presence of natural/critical habitats, feeding, resting and nesting sites, migration routes of endangered species and the overall ecology on which they depend¹⁶.
- Provide guidelines to dealing with the limited time to collect data and to engage with affected groups.
- Outline how DWIR will be enabled and supported in the implementation of this dredging framework?
- Outline impacts will be monitored and managed and how collaboration will take place between relevant institutions.

Recommendations

In the next stages of the ESIA process and the ESIA report, the following needs to be followed up and presented:

Show what considerations and efforts will be made to avoid, minimize and mitigate dredging impacts, for instance through:

- Avoiding dredging or disposing dredging material in critical habitats of endangered / endemic species and near fishing grounds.
- Changes in the project design and choices (e.g. dredging equipment and disposal methods) to avoid or minimize impacts.
- Measures to reduce the risk of collision of (large) endangered species with dredging equipment (e.g. dredging schedules, vessel speed, engaging wildlife observers).
- Adaptations in timing and plans for dredging considering factors like spawning seasons to reduce impacts on breeding success and migration period of animals.
- Measures to reduce turbidity and sedimentation, where and when needed.

Present the results of the impact assessment:

- Identify and present areas of natural and critical habitats and fishery resources in the project's area of influence. Determine parameters that need to be studied and monitored over time. Collect baseline data on these parameters.

¹⁶ See also EHS Guidelines for Ports Harbors and Terminals (2017) requiring that areas of high biodiversity value used by aquatic species for feeding, breeding and migration routes should be identified. This is also underlined in Myanmar's Statement National Biodiversity strategy and action plan 2015–2020 <https://www.cbd.int/doc/world/mm/mm-nbsap-v2-en.pdf> see page 82

- Complete the list of endemic, globally threatened species and fish species that may be affected by the project. Consult stakeholders and determine a substantiated list of species to be prioritized in the further ESIA and ESMP.

- Identify and specify small-scale and leasehold fishers that may be affected by the project. Present the potential magnitude of the impacts on fishery resources and the loss of livelihoods throughout the project's lifecycle.
- Define what criteria have been used to evaluate the significance of impacts, and how national and international obligations and norms for conservation and wetland development in Myanmar were taken into consideration.
- Assess and present direct, indirect and cumulative impacts on biodiversity and in particular to natural/critical habitats and endangered species. Include all relevant sources of impacts¹⁷. Specify what residual impacts will remain after mitigation.
- Substantiate in the ESIA that no-net reduction of natural habitats and a net-gain in critical habitats will occur, also over a longer period.

Deliver all relevant mitigation measures and plans:

- Outline how impacts on fishery resources and on livelihoods will be avoided, mitigated or compensated conform IFC PS requirements.
- Deliver a bio-diversity monitoring and evaluation program and if needed a Biodiversity offset and/or Biodiversity Action Plan.
- Framework for the dredging:
 - o Clarify how the project will deal with the continuous stakeholder engagement in the yearly preparation of the dredging work
- Outline the arrangements, roles and responsibilities of key institutions like IWT, DWIR and departments responsible for nature and wildlife conservation, as well as budgets for the monitoring and adaptive management of impacts on biodiversity and fisheries.
- Ensure that the framework for DWIR to prepare the yearly dredging works includes clear guidelines to integrate environmental and social concerns into dredging plans and activities.

3.1.3 River Morphology

Chindwin river is reported to have a disturbed sediment balance as a result of deforestation, mining and other human interventions. Currently, major flooding and riverbank erosion are mentioned as existing problems, leading to a loss in property and agricultural land. In the scoping report it is stated that no additional morphological studies are required because the low dredging quantities will not impact the overall morphology. It is also explained that a

¹⁷ EHS Guidelines Ports Harbors and Terminals (2017) require projects to assess and model sensitive ecological receptors, for instance through sediment plume propagation modeling, to define a Dredging Management Plan.

detailed morphological study would require a lot of data which is not yet available. The NCEA notes the following:

- Dredging (even relatively small volumes) could disturb the sediment balance in the Chindwin River. Removing sediment at one place and disposing it at another could create changes in flow, velocity, water depth and sedimentation, which may reinforce existing processes underlying flooding and riverbank erosion. Changes in the bathymetry could also affect fish species that are important to local people or that are endangered ¹⁸. Also, the placement of the floating jetties may result in local alterations in flow conditions and sedimentation near the area of attachment (scour).
- In addition, the NCEA notes that a reduction of soil stability is a risk that could be associated with dredging. When dredging takes place near the shore where soft layers are present, this could lead to riverbank erosion and even landslides. This is a small, but serious risk that needs to be considered in the impact assessment.
- In sum, as impacts cannot be ruled out, the NCEA is of the opinion that a study on the river morphology should be included in the assessment to understand (or to rule out) negative consequences on flooding, riverbank erosion and flora and fauna. In case such data is not yet available, the ESIA/ESMP could try to address this through a monitoring system by which data is collected over-time to oversee potential changes to the river-morphology.

Recommendations

In the further ESIA process and the ESIA report:

- Potential impacts from the project on river morphology are studied and outlined. In case no impacts are expected, this is substantiated with verifiable data and analysis.
- Show how the information on the river-morphology has informed the following:
 - o Jetty siting and design and potentially scour protection of the construction poles.
 - o Methods and locations for the disposal of dredging material (see later section 3.3.2)
 - o Framework to prepare the yearly dredging works (see section 3.1.3).
 - o Measures and plans to mitigate impacts, in case relevant.
- Show how the risk for reduced soil stability and landslides around dredging locations are considered in the ESIA.
- Include the monitoring of river-morphology and arrangements for mitigation, whenever the need may occur, in the ESMP.

¹⁸ Dredging and the disposal of dredging material in deeper parts of the river could jeopardize fish species that depend on a diverse river bathymetry and that dwell in deep pools or eddies.

3.2 Safety and Socio–Economic Impacts

3.2.1 Safety of the proposed ferries

The project intends to improve the safety of river transport in the Sagaing region. At the same time, the project also warrants concerns for safety because certain risks are associated with the proposed type of FRP ferries, which are manufactured from composite material:

- Conventional FRP materials are vulnerable to fire¹⁹. They lose their strength quickly at relatively low temperatures and can ignite rapidly²⁰. The International Maritime Organisation (IMO) for instance requires the use of non-combustible materials for such vessels.
- The proposed vessels are, from a structural perspective, vulnerable to damage from collisions with floating logs and to grounding in shallow water depths. These both appear to be likely risks in the project area. Also, collisions with passing traffic and during approach to a berth cannot be ruled out. Experience suggests that FRP vessels offer very little time for reaction in case of such hazards.
- In addition, an underlying problem related to safety in current river transport in Myanmar is stated in the scoping report to be the lack of law enforcement and institutional capacity. If these institutional problems are not tackled, risks to safety will remain among private and public services, regardless of the boat type.

In the light of these risks, the following issues need to be addressed in the ESIA:

- **Provide evidence on the proven design.** Evidence that the vessel is of a proven design relevant to the risks of intended operations and the intended operating environment would be required for a safety assessment as part of the ESIA.
- **Assess risks to inform the project and safety management plans.** In the explanation provided by the ESIA team, it is stated that because the proposed vessels are of proven design, the ESIA will not assess the design itself. Section 9.4 of the scoping report does refer to a risk assessment to be carried out for passengers and crew. The NCEA has the following to remark:
 - Although relevant, being of proven design will be no guarantee for (long term) safety. A risks assessment in relation to navigation would still be needed to inform design and safety management plans.
 - Adequate water depths, a navigation channel clear from logs and navigational marks in the river are important conditions for safety. These factors need to be considered in the risk assessment. There is also a need to sort out who will be responsible to removing logs upstream from Homalin, since DWIR only clears logs downstream from Homalin.
- **Include an institutional assessment and formulate a capacity building plan.** Safety management in the proposed project depends on the capacity of various institutions and how they will coordinate and collaborate. The ESIA needs to pay attention to the

¹⁹ This could relate to various factors such as a) electrical defects b) mechanical or engine failures c) the release of oil onto hot surfaces or contact with source of ignition d) fire due to ignition sources like cigarettes or defective electrical equipment

²⁰ Conventional FRP materials lose strength at a relatively low temperature when compared to steel, making them more sensitive to high temperatures caused by fire. Tests have shown that critical temperature could be reached, typically within one minute, if the FRP composite is directly exposed to fire. In case mitigation efforts fail, the ship superstructure could eventually collapse altogether. For more information see for instance: Franz Evergren (2015) Engineering Analysis Report – Eco-Island Ferry. SP Fire Research Report 2015:05. Borås. SP Technical Research Institute of Sweden

functioning of current safety administration and outline what conditions need to be put in place for appropriate safety management. Especially note that:

- Domestic safety regulations (which are now being formulated) and clear operational procedures for the proposed type of ferries will be important.
- It will be crucial that the Department of Marine Administration (DMA) and IWT have the technical capacity to evaluate and approve the engineering design and deal with the safety of the new ferries and jetties.

Recommendations

In the next stages of the ESIA:

- Carry out an institutional analysis and assess the capacity needs for safety management.
- Analyze hazards to understand the patterns in previous ferry accidents. Carry out a risk assessment to the navigational safety to inform a safety management plan. This should cover risks like fire and flooding onboard, grounding in shallow patches, collision of the ferries with floating logs, passing traffic and dredgers and oil spills.

Present in the ESIA report:

- Details on the docking plan and on the proven design of the ferries. Ensure these are equivalent to internationally recognized safety standards (e.g. by the International Maritime Organisation (IMO) or the EU Directive 2009/45/EC). Show how the following considerations have been integrated into the design of the ferries:
 - Early and rapid evacuation in case of hazards
 - Robust protective measures to withstand fire and collision
 - Possibility of encountering shallow water depths and floating logs, in relation to the propeller and stability designs (e.g. propeller design not proud of the keel)
- Include a summary of how safety management is planned, an organogram and an overview the functioning, resource capacity for safety management. Outline the roles and responsibilities in the project for a) monitoring b) safety performance audits c) repairs and routine maintenance d) periodic safety inspections e) providing aids for navigational safety (danger marks, removal of logs, safe water depth levels, communication means) f) monitoring ferry accidents and g) departure controls.
- Outline the safety regulations, standards and procedures for operating the ferries.
- Deliver plans and measures for safety and emergency management including:
 - Navigational aids on board of the vessel and onshore (e.g. navigational marks, visual aids for night navigation, technologies to find sufficient water depths)
 - Safety equipment, fire safety and life-saving arrangements
 - Fire safety and management plans
 - An organization and communication plan for emergency response and evacuation
 - Arrangements to compensate passengers for eventualities suffered on board (e.g. insurance schemes).
 - Capacity building plan for continued training of administration, crew and emergency responders

It is further recommended to consider:

- Whether the ferry design construction, material, equipment and safety arrangements are according to any national standards and have been approved by any National Maritime Administration and also communicated to the IMO, for dissemination.
- Whether the proposed ferries are in service in an area equivalent to the project location.

3.2.2 Physical and Economic Displacement

The scoping report indicates that the applicability of **IFC PS 5 on Land Acquisition and Involuntary Resettlement** is 'possible'. Physical displacement is not identified as a major risk, because the jetty locations are expected to remain the same. Nevertheless, other information in the scoping report suggests that there are several groups that could be impacted. In addition to the potential impacts on small-scale and leasehold fishers outlined in 3.1, the following groups may face loss of shelter, assets and/or access to land or livelihoods:

- 16 families make informal use of the Monywa shipyard site during the dry season. Will these people be affected during the proposed shipyard upgrading?
- The livelihoods of food and beverage vendors and other small-scale businesses living on or near the proposed landing sites may be affected due to increased competition from food & beverage services integrated in the ferry services.
- Impacts on gold, gravel and sand miners are not expected. This needs to be confirmed in the ongoing assessment. The new ferry service could also affect livelihoods of existing private sector ferry operators.

Recommendations

Indicate in the final ESIA study:

- How the project design has been modified to avoid physical and economic displacement and other impacts on communities.
- Minimize and mitigate livelihood impacts, for instance through integrating existing food and beverage providers in the project's food and beverage supply chain.
- In case there are still residual physical/economic displacement impacts after appropriate mitigation, include in the ESIA a ToR for the development of an additional Resettlement Action Plan or Livelihood Restoration Plan.

3.3 Alternatives

3.3.1 All year round ferry service

An important function of impact assessment is finding ways to avoid adverse significant impacts. This is underlined in **IFC PS 1**, which calls for the adoption of a mitigation hierarchy to 'anticipate, avoid or where avoidance is not possible to minimize, mitigate or to compensate for risks and impacts'. Considering the earlier outlined potential impacts from dredging, alternative solutions where dredging is not required are important to explore.

- In the scoping report, it is explained that a certain amount of dredging is necessary to provide the locally needed transport services in the dry season, especially during the peak season. A general figure is given that justifies the overall demand for river transport.
- However, exact figures and analysis on current and forecasted demand in the dry season and especially when draughts are insufficient for river transport, would be helpful to

present in the ESIA. This information will enable an understanding why the project cannot be designed without a need for dredging, and justify why alternatives for an all year round service, like seasonal ferry services or their temporary stop in periods of insufficient draughts, have not been considered. The following information needs to be presented in the ESIA:

- *What are exactly the periods when draughts are not sufficient for river transport (which necessities dredging)? What is the exact demand for river transport in this period? What other modes of transport do people use in this period?*
- *What are the periods that ferries have an overcapacity in the dry season? Does this coincide with insufficient draught levels?*

In case there is little demand for a ferry service when draughts are insufficient, alternatives for the all-year round service need to be re-considered in the ESIA. In case a high demand for ferry services coincides with periods of insufficient draught levels, the necessity for dredging and the reason for leaving out alternatives for an all-year round service would be clarified.

3.3.2 Dredging equipment and disposal methods

In the dredging study undertaken, several types of dredging equipment have been compared and Backhoe Dredgers (BHD) were selected as the preferred method, primarily based on their availability at DWIR and their suitability for local draught conditions. Similarly, keeping the dredged material in the river system is the preferred disposal method, because it prevents material from being extracted from the system and dredging is less time consuming. The scoping report indicates that alternatives for the above choices will not be studied in the ESIA. It is explained that the feasibility study for the project has already considered alternative methods, and the conclusions from that study will not be revisited in the ESIA.

The NCEA wants to note that the identification and the comparison of alternatives is a core function of an ESIA. Key to this function is that alternatives are considered that have an advantage in terms of environmental and social performance, and that the comparison looks at how options differentiate in terms of environmental and social impact. The comparison of alternative dredging and disposal methods was undertaken in the feasibility study and therein several social and environmental considerations were taken into account. But the focus is on technical and economic feasibility. The ESIA can build on this study, by a more comprehensive consideration of environmental and social concerns in these alternatives. For

instance, the ESIA may show that using a BHD compares less favorable, because it cannot be combined with on-land disposal, which may have certain advantages²¹. Identification and comparison of alternatives could take place as suggested in Box 1.

Box 1.

Example: How to define dredging and disposal alternatives in an ESIA

1. Determine what lives on land/riverbank, air, water and the riverbed.
2. Assess flora and fauna (see section 3.1) on their sensitivity to impacts from dredging/disposal, e.g.:
 - Impacts on water quality from increased turbidity, sedimentation
 - Smothering of benthic habitats
 - Release of contaminants to the water column due to re-suspension of sediments
 - Changes of certain chemical compounds of the dredged materials when exposed to different levels of oxygenation
 - Reduced light penetration impacting light sensitive organisms and impacts on seagrass beds, algae etc. from suspended sediment plumes
 - Underwater / airborne sound and vibration
 - And so on.
3. Identify alternatives/options, for dredging and disposing dredged materials. Define and assess different dredging scenario's.
4. Select the best option.

Based on EHS Ports and Harbors (2017) and PIANC guidelines #100

<https://www.pianc.org/publications/envicom/dredging-management-practices-for-the-environment-a->

Some additional remarks:

- Equipment such as the Trailing Suction Hopper Dredgers is said not to be available. The ESIA report needs to clarify whether equipment available at local institutions (e.g. Myanmar Port Authority, the private sector) were also considered before arriving at this conclusion.
- Onshore disposal is said to be challenging due to limited time available to prepare onshore disposal sites. From an environmental and social perspective, on-land disposal methods need to be considered as an alternative (e.g. the beneficial use of dredged materials, for example in eroding stretches of the river or land reclamations, or the use of the same (multiple) disposal site(s)), because it may have important advantages. With on-land disposal, Cutting Suction Dredgers could also be re-considered.
- Ploughing: is expected to be difficult because of coarse sediments, necessitating more advanced equipment. The combination of a plough (which is relatively easier to mobilize),

²¹ In the scoping report, disposal in the river is expected to cause limited impacts because it is planned at the end of the wet season when river sediment transport is still high. The increase in turbidity compared to baseline values is expected to be low. This expectation needs to be substantiated with more comprehensive data and analysis. Other possibility is that at the end of the wet season the turbidity levels have relatively decreased, and certain species may be benefiting from the stable conditions that are created by lower turbidity levels.

with more advanced equipment could generate more flexibility in the time of dredging. This option could be explored in the ESIA.

- For river disposal, a comparison of split hopper barges versus the use of a spreader pontoon could be considered.

Recommendations

In the coming stages of the ESIA and in the ESIA report:

- Include an analysis of current and forecasted demand for river transport specific for the period that necessitates dredging, to justify that dredging cannot be avoided.
- Define an alternative scenario for dredging and disposal of dredging material that minimizes social and environmental impacts. This scenario could combine some of the following elements:
 - o Cutter Section Dredgers or another type of equipment
 - o Onshore disposal of dredged material, for instance:
 - The beneficial reuse of dredged material, e.g. in places with riverbank erosion or to bolster jetty platforms
 - Different locations for disposal or the use of 1 disposal site year after year
 - Different methods to place dredged material onshore (e.g. pumping, sailing barges to the shore and emptying with grabs, rainbowing, conveyor belt).
 - o Ploughing during the wet season
- Compare in the ESIA the proposed and the alternative scenarios. Present how the two scenarios for dredging perform on social and environmental indicators (e.g. impacts on critical habitats, turbidity, greenhouse gasses, risk of collisions with mammals, entrapment of fish and turtles, safety, morphology and impacts like riverbank erosion and flooding).
- Explain why the proposed dredging equipment and methods for disposal are selected, with reference to the consideration of results from the impact assessment.

3.3.3 FRP ferries and pontoons

Safety risks in a river transport service can never be entirely ruled out. It is however possible to reduce risks as much as possible, by selecting the most appropriate type/material of vessel and jetties and design. Fibre Reinforced Plastic (FRP) is the preferred type of ferry and pontoon material for this project. This will require a clear justification in the ESIA report, especially in the light of the associated safety risks as outlined in section 3.2.1. In the scoping report, the study of Steel Hull Ferries as an alternative to the FRP ferries is included. The NCEA would like to emphasize the importance of analyzing the safety and environmental performance of this alternative versus the FRP alternatives and to present clearly in the ESIA.

The project proposes also an FRP pontoon jetty. The ESIA should explore the alternative of upgrading existing landing facilities or constructing new facilities using locally sourced material and local expertise.

Recommendations

In the further assessment and final ESIA report:

- Compare the proposed FRP ferries with Steel Hull Ferries on their performance on safety & environmental and social concerns.
- Compare the proposed FRP pontoons with alternatives, for instance those with other type of material and/or that can be locally sourced, to justify the proposed alternative.
- Present the results of the comparison and justify the final ESIA report why a certain type of ferry is preferred.

3.4 Stakeholder engagement in the ESIA

The NCEA notes that several informative consultations have been held with institutional stakeholders and a list of stakeholders to be engaged is provided. Some remarks:

- The ESIA team will engage affected stakeholders in the next stages. Note that civil society groups are not mentioned in the stakeholder mapping (4-2) and engagement activities (Table 4-3).
- The way the stakeholders are categorized and presented (i.e. the structure of Table 4-1) is not entirely clear. For instance, only the IWT is included as a directly affected institutional stakeholder. Why have DWIR or the department of wildlife and other institutions that may be assigned with responsibilities not been included? Some stakeholders are not yet specified: for example, which CSOs will be engaged? Who will represent affected groups like the fishermen, alluvial farmers and gold miners?
- The schedule of stakeholder engagement activities (Table 4-3) is generic. It would be helpful to specify how many focus group discussions will be held, at what locations and how the information generated in the ESIA will be disclosed. The scoping and the upcoming ESIA report should be made available to the public, stakeholders, and decision makers to inform them, in an understandable fashion, about the project and how environmental and social impacts will be managed.
- The development of a Stakeholder Engagement Plan (SEP) for the implementation phase will be IWT's responsibility. How will they coordinate with DWIR on stakeholder engagement during the implementation of dredging activities?
- Several stakeholder comments made during meetings and interviews are in contrast with the analysis in the feasibility study and related project choices. No further explanation is given on how these comments have been or will be addressed. Their comments refer for instance to:
 - An expected sharp decline in the number of passengers using river transport, due to the scaling down in mining operations and road and bridge improvements
 - An overcapacity of ferry boats in the dry season, when people prefer to use roads
 - That an intercity will not work as most passengers come from smaller villages: because they are poor they will not want to spend more money to travel to and from the towns where the ferries will stop. People use boats for short distance travels to access villages on the banks of the river.
 - Concerns about the ability of fibre glass to withstand contact with rocks and floating logs

Recommendations

For the subsequent assessment work and the final ESIA report:

- Ensure additional stakeholder meetings with affected people and civil society groups are planned to obtain their views on the project's impacts, mitigation measures, alternatives and the way they would want to be engaged in the ESIA and the implementation phase.
- Specify in the Stakeholder Engagement Plan:
 - o How will information about the project be disclosed with the public and civil society?
 - o Who are the different stakeholders, where are they located and by whom will they be represented?
 - o How will stakeholders be engaged? What information and decisions will be discussed with them?
 - o What will the engagement of affected people look like, including the process for those affected by physical and/or economic displacement?
 - o What will be the role of DWIR in stakeholder engagement and how will IWT and DWIR coordinate this?
- Before holding public consultations, disseminate non-technical, culturally appropriate project information materials in locations that are easily accessible to project-affected people.
- Present clearly the main concerns, needs and expectations of stakeholders and how their feedback has been taken into account in project decisions and mitigation plans.
- Until a fully-fledged grievance mechanism is established, consider assigning a person to be responsible for grievances and information requests from communities and other stakeholders.

4. Detailed comments on IFC PS

In earlier chapters of this advisory report, the NCEA outlined several key observations and recommendations on the scoping report for the project Passenger Transport Chindwin. In this chapter, the focus is on the points of attention in relation to IFC PS requirements, which need to be addressed in the further scoping / ESIA process. It should however be noted that the earlier mentioned key observations also have a direct link to the IFC PS. Therefore, the table below only presents several detailed and additional comments which have not yet been highlighted before.

Performance Standards: brief explanation and focus points	Comments
IFC PS 1. Assessment and Management of Environmental and Social Risks and Impacts	
<ul style="list-style-type: none"> • Identify and assess social and environmental risks and impacts, both positive and negative, in the project's area of influence • Avoid, minimize, mitigate or compensate for adverse impacts on workers, communities and the environment • Establish environmental and social action plans defining desired outcomes, actions, measurable targets, performance indicators, timelines and resources • Establish procedures to monitor the effectiveness of the ESMMP. Disclose the ESMMP Action Plan to the project affected people • Identify and analyse stakeholders that may be affected. Formulate a Stakeholder Engagement Plan to ensure their appropriate engagement • Disclose information to stakeholders in an accessible, easy to understand, transparent and culturally appropriate manner • Provide affected groups opportunity to express their views on project risks, impacts and mitigation measures. • Establish grievance mechanisms and systems to report to affected groups • Establish and maintain an appropriate Social and Environmental Management System 	<ul style="list-style-type: none"> • As part of stakeholder engagement, ideally before holding public consultations, the project should develop non-technical, culturally appropriate information materials to be disseminated in locations that are easily accessible to project-affected people. • Several institutions other than the proponent will play a role in the management of social and environmental risks. These institutions such as DWIR and departments responsible for nature / wildlife conservation or safety, should be supported in fulfilling their role in the project's ESMP.
IFC PS 2. Labor and Working Conditions	
<p>This PS recognizes fundamental rights of workers, guided by ILO and UN Conventions. The PS requires:</p>	<ul style="list-style-type: none"> • The NCEA understands that operational procedures for the upgrade of the two shipyards, will be given attention and areas requiring strengthening will

<ul style="list-style-type: none"> • Fair treatment, non-discrimination, equal opportunity to workers • Good worker – management relationship and good relationship with worker’s organisations • Compliance with national employment and labor laws • Protection of workers, provide good working conditions, promote safety and health, minimize hazards consistent with international good industry practice • Avoid use of forced labor, or harmful child labor • Freedom of association and collective bargaining • Adopt and implement policy and procedures around Child labor, forced labor, gender policies, monitoring of third-party performance • Establish Grievance Mechanism for workers 	<p>be brought to light. Some points of attention would be:</p> <ul style="list-style-type: none"> – Develop a worker’s grievance mechanism for the ferry staff, shipyard workers and project employees. – Deliver a staffing plan of the ferries to provide insight into working schedules. Would it be the same crew operating the entire voyage or are shifts planned at designated ports? Does the ferry provide resting quarters? • Appropriate policies and guidelines for subcontractors need to be developed, integrated into contracts, to safeguard rights of casual workers and temporary labor force. • Include in the ESMP/ESMS regular monitoring of working conditions and compliance with standards for child labor, fair treatment and non-discrimination.
<p>IFC PS 3. Resource Efficiency and Pollution Prevention</p>	
<ul style="list-style-type: none"> • Introduce measures to improve efficiency in water consumption, energy and other resources and material inputs. Integrate principles of cleaner production into project design • Avoid, minimize, and clean up pollutants and hazardous/non-hazardous wastes. Use good international practice and technologies (including EHS guidelines). • Addresses issues like water pollution, land contamination, handling of hazardous materials and disposal of industrial waste • Reduce greenhouse gas emissions. Consider alternatives to reduce GHG emissions. If more than 25.000 tonnes of CO2 emissions per year are expected (by all project related activities) these emissions need to be quantified 	<p>Various sources of pollution and emissions are identified. What has not been (explicitly) referred to in the scoping report is the following:</p> <ul style="list-style-type: none"> • Environmentally friendly disposal of composite material like FRP is known to be complicated and expensive²². Ensure that the ferries are provided with a green passport and a plan for the safe and environmentally sound recycling at the end of their service life. The proposed jetties also need to be provided with a similar plan or alternately constructed from locally sourced environment friendly material. • The intention is to use better quality fuel. This is an improvement, but not a positive impact as suggested. The project will still use a significant amount of fuel, leading to CO2 emissions (with a chance of exceeding

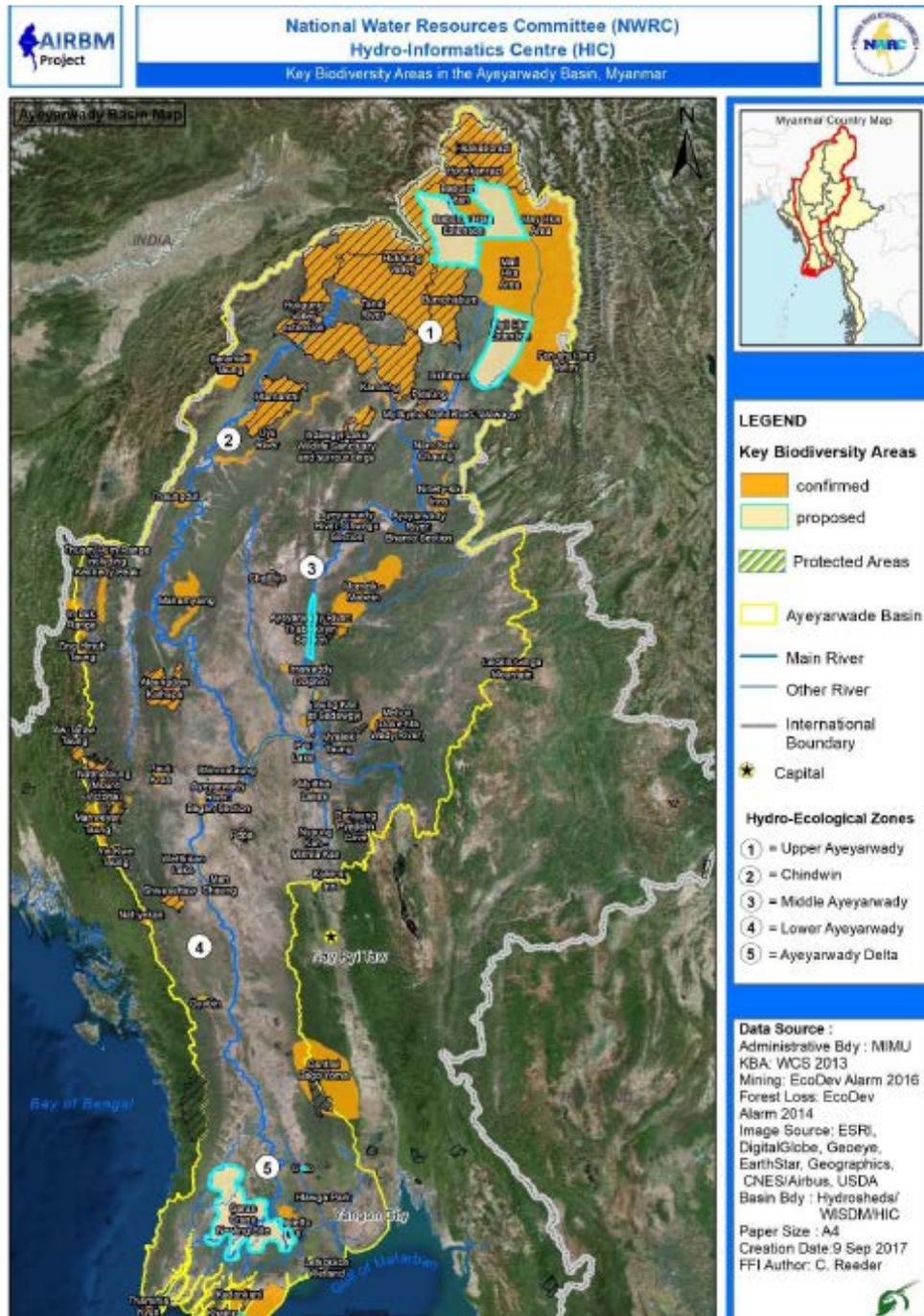
²² Franz Evergren (2015) Engineering Analysis Report – Eco-Island Ferry. SP Fire Research Report 2015:05. Boras. SP Technical Research Institute of Sweden

	<p>25.000 tons) per year. Dredging equipment with lower emission levels (low sulphur fuels or LNG) could be considered here.</p> <ul style="list-style-type: none"> • It is not clear why the dredging plan for the project is to work from downstream to upstream. There may be good reasons for this approach, but these are not mentioned. Working the other way around could help avoid pollution of the areas already dredged.
<p>IFC PS 4. Community Health, Safety and Security</p>	
<p>This PS addresses proponent’s responsibility to avoid and minimize risks and impacts that may arise from project activities, equipment and infrastructure. The implementation of actions is managed through the client’s ESMMP (ref PS-1).</p> <ul style="list-style-type: none"> • Identify, evaluate, avoiding or minimize risks and impacts on the health and safety of the local community during the project life cycle including: <ul style="list-style-type: none"> – Risk of exposure to hazardous materials during delivery, use and disposal – Adverse impacts on ecosystem services – Exposure to water related and communicable diseases • Design, construct, operate and decommission structural elements consistent with good international industry practice • In case of potential risks, formulate and coordinate with stakeholders (responsible agencies, affected communities) an Emergency Preparedness and Response Plans so they can fully understand the risks • Security arrangements do not jeopardize the community’s safety and security 	<ul style="list-style-type: none"> • The FRP pontoon jetty with a leading bridge is expected to enhance passenger safety during embarkation/disembarkation. In order to realise the full benefits of enhanced safety, the associated civil works leading up to the pontoon bridge would be required to be included in the project planning and implementation process. • Reduced navigability (e.g. for fishers) and collision risk with passing traffic, including dredging equipment. • Reduced air quality due to emissions caused by the use of heavy fuels by dredging equipment and the associated health impacts • Hindrance from airborne sound when dredging takes place near human receptors. Depending on how construction materials will be transported (River? Road?) there may be off-or on-shore impacts from increased vessel or truck movement in areas outside the project location. • Reduced water quality around dredging areas, impacting existing water use • The seat ergonomics in the ferries, particularly considering physiological implications of the long voyages • The need for insurance and compensation in case of a hazard causing damage to the safety and health of communities, crew or passengers.
<p>IFC PS 5. Land Acquisition and Involuntary Resettlement</p>	
<ul style="list-style-type: none"> • Avoid or minimize physical and economic displacement (through alternative project designs) and the adverse impacts from resettlement. This also counts for associated facilities not funded by the proponent, but which are essential the project’s success 	<ul style="list-style-type: none"> • Informal settlers (‘squatters’) and small vendors are likely poor and vulnerable groups that require specific safeguard measures, • An operational-level grievance mechanism needs to be established as soon

<ul style="list-style-type: none"> • Improve or restore the living condition and livelihoods of displaced persons, both including persons with formal and not formal land rights. Pay specific attention to poor and vulnerable groups • Formulate a Resettlement Action Plan (RAP) and a Livelihood Restoration Plan (LRP) through collaborative and informed decision making. Monitor and evaluate the implementation of RAP/LRP and establish a separate grievance mechanism 	<p>as possible, with a clear explanation of whom and how to contact in case of complaints and/or questions.</p> <ul style="list-style-type: none"> • After avoiding and mitigation, in case of physical / economic displacement remain, livelihoods should be restored and any loss of assets should be compensated based on full replacement costs. In such a situation a detailed RAP or / LRP is required and a separate SEP for affected groups.
<p>IFC PS 6. Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	
<ul style="list-style-type: none"> • Covers protection and conservation of biodiversity in modified, natural and critical habitats. In critical habitats no project activities are allowed unless no viable alternatives exist and there will be no adverse impacts on the critical habitat • Direct and indirect impacts on biodiversity and ecosystems need to be evaluated, avoided and mitigated. Competent professionals need to be engaged. • Proponents must adopt an adaptive management to ensure that mitigation measures are responsive to changing conditions • Maintain benefits from ecosystem services and manage natural resources sustainably founded on a multi-stakeholder consultative process • In projects with significant biodiversity issues (e.g. sensitive habitats or endangered species), a Biodiversity Action Plan should be prepared, with net gain for Critical Habitat and no net loss for 'Natural Habitats' 	<ul style="list-style-type: none"> • The project takes place within the Chindwin River system which is high in ecological and biodiversity values. It is one of the few remaining rivers in the region that has not been dammed or changed by structures that alter the flow and water balance of the river. Issues related to biodiversity have already been outlined in detail elsewhere in this advice.
<p>IFC PS 7. Indigenous Peoples</p>	
<ul style="list-style-type: none"> • This PS calls for the avoidance/minimization of impacts on indigenous peoples • Sustainable and culturally appropriate development of benefits and opportunities. • Free, Prior and Informed Consent (FPIC) in certain circumstances, and participative mapping of land and resources and assessments of impacts 	<p>In the ESIA process, as locations of activities will become clear, a more precise overview of affected groups will need to be developed. In case the traditional land of indigenous peoples are directly affected, FPIC may apply. This needs to be clarified in further ESIA steps.</p>
<p>IFC PS 8. Cultural Heritage</p>	
<p>This PS calls for the:</p> <ul style="list-style-type: none"> • Protection, preservation of cultural heritage (e.g. religious sites, historical artefacts) • Promotional of equitable sharing of cultural heritage benefits 	<p>During construction of the jetties, dredging as well as the expansion of a shipyard a 'chance find' procedure needs to be followed. This is a specific procedure required when discovering historical artefacts as outlined in article 8 and Guidance Note 15 of IFC PS 8.</p>

Annex 1 KBA's & Protected Areas Myanmar

The Chindwin Basin is rich in biodiversity values and home to 8 protected Key Biodiversity Areas (KBA). Four of these areas touch on the river itself and three are situated in the project area. The Chindwin River has the potential to become a Ramsar site, considering the population of water birds and other species that hibernate and stop over. The entire Chindwin basin is referred to as one of Myanmar's important national wetlands in the National Wetland Policy (2019).



Source: Zöckler & Kottelat (2017) SOBA 4.5 Biodiversity of the Ayeyarwady Basin. Updated in 2018.