Netherlands Commission for
Environmental Assessment

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First Advisory Review of the ESIA for the Pan Hlaing Sluice Project

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Advisory Review by the NCEA

Title	**First Advisory Review of the ESIA for the Pan Hlaing Sluice Project**
To	Rijksdienst voor Ondernemend Nederland (RVO)
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Request by	Mr Hugo de Rijke
Date	18-10-2019
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1. Introduction

1.1 Project initiative

The Pan Hlaing Sluice Project is initiated, and will be owned by, the Myanmar Ministry of Agriculture, Livestock and Irrigation (MoALI). This project started as part of the Memorandum of Understanding between the Government of Myanmar and the Government of the Netherlands to collaborate on water challenges, partly as a learning-by-doing project. Presently, the development of the project is supported by the Dutch Enterprise Facility, RVO, through the D2B funding facility.

This project is known as the Pan Hlaing Sluice Project, located west of Yangon in the Pan Hlaing River. The Pan Hlaing River connects the Ayeyarwady River to the east (which provides inflow of freshwater) and the Yangon River to the west (which provides inflow of saline water due to the tidal influence); see figure 1. The project's aim is to construct a multi-functional sluice in the Pan Hlaing River, to achieve the following objectives:

- Fresh water reservoir function: The Pan Hliang River will become a seasonal freshwater reservoir that will provide additional water to supply approximately 40,000 acres, or 16,187 hectares (gross area) of agricultural land during the dry period. The reservoir will also provide freshwater for domestic use for future extension of the residential area of Yangon and freshwater use by industries adjacent to the Pan Hlaing River;
- Mitigation of salt intrusion and sedimentation from the Yangon River towards the Pan Hlaing River;
- Flood control function: Improving rainstorm flood control by arresting high tides from the Yangon River, whilst at the same time allowing for enough drainage.

The operation of the sluice will be highly dynamic and is complex because of the combinations of different functions. See figure 2 for a sketch impression of the proposed Pan Hlaing Sluice.

The Pan Hlaing Sluice Project is the last phase of the rehabilitation of the Pan Hlaing River. In the last decades, almost the entire Pan Hlaing river had silted up. MoALI intended to rehabilitate this river and in 2014-2015 they constructed the Mezali sluice 2 and dredged the river. With the execution of the proposed Pan Hlaing sluice project, the rehabilitation of the Pan Hlaing River will be completed, and siltation is expected to be under control.

Figure 1: Plan view of Pan Hlaing River (the river section that is directly related to the project is shown in green) in between the Ayeyarwady River and the Yangon River.

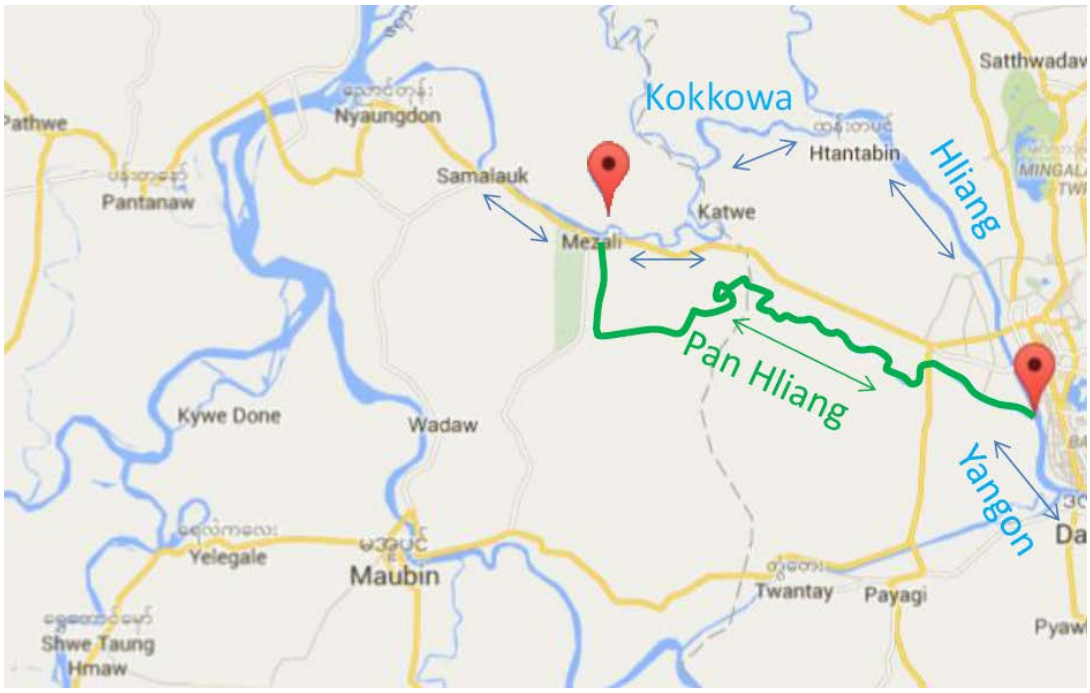
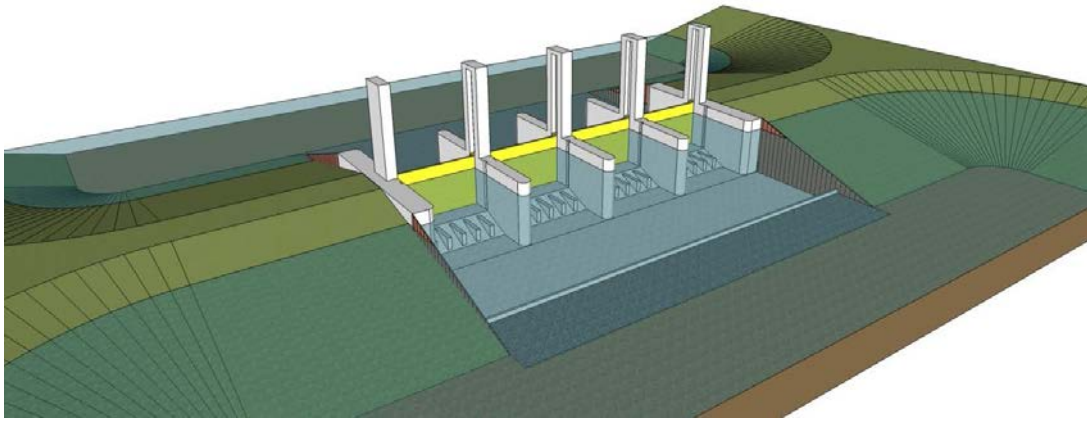


Figure 2: A sketch impression of Pan Hlaing Sluice looking towards the Pan Hlaing River. Source: Final Feasibility Study Pan Hlaing Sluice, Myanmar, 8 April 2016):



1.2 Approach by the NCEA

Request for this 2nd advisory report

In May 2019, RVO requested the Netherlands Commission for Environmental Assessment (NCEA) to review the quality of the Environmental and Social Impact Assessment report (ESIA).

Expert working group

This advisory report has been prepared by a working group of the NCEA which consists of the following experts:

- Mr Arend Kolhoff: technical secretary and ESIA and environmental expert;
- Mr Gert Jan Akkerman: river and coastal expert;
- Mr Jeroen de Zeeuw: social expert;
- Ms Tanya van Gool: chair.

The Dutch Ministry of Foreign Affairs has funded the preparation of this advisory report under a multi-annual agreement with the NCEA to provide such services in a selected number of countries, including Myanmar.

Justification of the approach

The NCEA assessed the ESIA to verify whether it is complete, correct and relevant for decision-making by RVO. The NCEA used the following benchmarks to review the ESIA:

- The 1st advisory report for the scoping stage of the ESIA has been prepared by the NCEA on request of MoALI (December 2016) and was made public March 30, 2017. This advisory report has been adopted by RVO as a benchmark.
- The Government of Myanmar requirements for ESIA, as explained in the ESIA procedure adopted in December 2015. Because the ESIA will follow the Myanmar EIA procedure.
- The IFC performance standards (2012) application of these standards is a requirement of RVO.

The working group of experts also relied on their own experience and knowledge gained through the review of many other ESIAs on similar projects.

The NCEA has reviewed the following ESIA report:

- Environmental and Social Impact Assessment – Pan Hlaing Sluice. Netherlands Enterprise Agency (RVO) & Irrigation and Water Utilisation Management Department; 15 May 2019. By: Arcadis Nederland B.V.

In addition, the NCEA studied the following documents to better understand the project:

1. PHRIDP report: Pan Hlaing River Integrated Development Plan (30 October 2015):
   This report focuses on the integrated development of the project: the project approach, data analysis, stakeholder analysis, the natural delta system, hydrodynamic modelling, agriculture and irrigation demands, factsheets and the sluice design within integrated development planning.
2. Final Feasibility Study Pan Hlaing Sluice, Myanmar (version 2, 4 July 2017):
   This report elaborates further on the sluice design, the relation with industrial wastewater discharged in the river, construction phasing and indicative cost estimation. The report leads to a design (sketch level) of Pan Hlaing Sluice. A major conclusion of the Feasibility Study is that the construction of the sluice is feasible and would undoubtedly contribute to the objectives set.

3. Feasibility Study, Environmental and Social Impact Assessment and Basic Design for the Pan Hlaing sluice R06. Basic Design Report. By RHDHV, 19 April 2019.

A draft version of this advisory report has been discussed with RVO and Arcadis on 4 September 2019.

Reading guide

In chapter 2, the main review observations and recommendations are presented. In chapter 3 additional and/or more detailed findings of the review are presented against the IFC-PS that require attention in the elaboration of mitigation and monitoring plans, necessary to comply with IFC.

2. Main review findings

Main conclusion

The NCEA appreciates the work that has been carried out and that resulted in the ESIA report of 352 pages. Although a lot of information has been gathered and analysed, the NCEA identified essential shortcomings in the ESIA for the following five issues. The NCEA noticed that an adjustment of the present project design will result in a more effective project and at the same time will further minimise the negative environmental and social effects. Suggestions for adjustment are presented under point b.

Main issues that need to be addressed:

A. Water quality of the seasonal reservoir
B. Mitigating measures and design of the project
C. Assessment of impacts and comparison of the alternatives
D. Non-technical summary
E. Stakeholder Engagement Plan

The NCEA concludes this ESIA does not provide sufficient information for informed decision making by RVO. The main shortcomings that need to be remedied in the ESIA are described in this chapter. In chapter 3, additional shortcomings are described that need to be remedied in order to meet the IFC Performance Standards

A. Water quality of the seasonal reservoir

The NCEA stated in its first advisory report (March 2017) that the creation of a seasonal freshwater reservoir for agricultural, domestic and industrial purposes is not feasible when the drainage of untreated poisonous industrial wastewater and solid waste is not adequately addressed. The ESIA provides additional evidence that the water quality of the planned reservoir does not meet standards for agricultural use. However, clear measures to stop the untreated discharge of polluted water and solid waste are not described. Solid waste and especially plastic can, in large quantities, affect the operational management of the project.

- **Recommendation**: The ESIA needs to make clear which measures will be taken and when, to secure that the discharge of polluted industrial water and solid waste is solved before the proposed project becomes operational.

B. Mitigation measures and design of the barrier

The Pan Hlaing sluice as described in the ESIA will change the brackish Pan Hlaing river into a freshwater reservoir. The environmental impacts and mitigating measures described in the ESIA are only assessed for the seasonally extreme situations, i.e. the pre-monsoon and the top of the monsoon, but not for (characteristically) more common seasonal conditions during and outside of the monsoon and dry period. This is a serious shortcoming, especially because during a major part of the year the conditions are such that optimised management of the tidal barrier provides the opportunity to further improve water quantity and quality, e.g. by introducing a (dynamic) gradual fresh-brackish-salt water gradient along the river that is beneficial for fish migration and will cause less impact on present biodiversity. Another issue here is that during the top of the monsoon, the Mezali Sluice 2 will be closed in order to allow for maximum drainage capacity of rainstorm water. However, the ESIA seems to suggest that this situation will generally apply to the whole monsoon period, thus ignoring

a major function of the Mezali Sluice 2. Instead this sluice may allow for controlled inflow, e.g. allowing a 'reduced natural' hydrograph, in order to create river flow that resembles present river flow in the wet season (albeit intermittent and somewhat reduced in intensity) and thus creating a 'flowing river' outside of the dry season. It is noted here, that in deviation from the present natural system, the inflow will be intermittent and attuned at the PHS functioning (blocking a part of the tide to enter in order to reduce salt water and sediment entrance from the downstream). Both opportunities, i.e. the controlled flowing river during the wet season, as well as a controlled gradual transition from saltier downstream towards fresh upstream, has not been described in the ESIA.

Advanced operational management will be crucial in relation to the above, acknowledging the high complexity of the hydro-morphodynamic system response and the operational functionality of the PHS. We think that the operational management of the PHS can, in due time, highly be optimised, together with an extension of physical functions (see below) in order to mitigate the adverse environmental impacts and at the same time to optimise the primary intended functions. Within this optimisation, *anticipatory* operational management (considering short- and medium-term predictions) of the project is also to be considered. From a practical point-of-view the operational management of the PHS may transit from relatively simple (focused on major functions), to more advanced (e.g. adding functionality for mitigation of adverse environmental impacts) after ample experience and progressive knowledge has been gained. In parallel, a gradual development of validated hydro-morphodynamic modelling, together with extensive measurement campaigns, will be indispensable. The project thus has the potential to become highly adaptive and robust, so to become an example of a project where the concept of adaptive management has extensively been applied, as recommended for this type of projects in the Integrated Ayeyarwady Delta Strategy.

The NCEA has studied the basic design of the project more in-depth (report nr 3). From this assessment, the NCEA observes that some adjustments of the design will provide opportunities to manage and further improve the water quantity, water quality, sedimentation and biodiversity during a significant part of the year.

- **Recommendations**:
  The NCEA recommends describing and assessing adjustments to the design that will improve the primary functions of the sluice and will effectively reduce negative environmental impacts. Several examples of adjustments of the design of 'the project' are briefly described, among others that could be identified:
  a. An example for the shipping lock is to allow the lock to discharge water during peak rainfall events in combination with high river runoff (this function has been mentioned in the ESIA report as an additional measure (e.g. emergency measure), but was not substantiated further into concrete measures for the design of the shipping lock). In this situation the lock will have to be made 'flood discharge proof', which will mainly come down to extensive and more heavy bed and bank protections in the vicinity of the lock.
  b. Another function is to allow flexible in and outflow around slack tide situations, which can be highly beneficial for free ship passage during short tidal windows, as well as for passage of e.g. fish. Slack tide refers here to the situation that the water level at the east side roughly corresponds to water level at the westside. In that

situation, the lock gates will have to be manageable (for opening and closing) under a predefined head difference on both sides of the lock and may have to be adapted to allow for such operation. Moreover, the bed and bank protections at the westside and east side should be made sufficiently stable to cope with these operations.

c. As an example, for the barrier, 'selective' water intake from and drainage to the Hlaing River may be realised by inserting additional 'window'-gates that are placed higher in the water column within the actual barrier gates. The window-gates will allow for intake of water that is less salty (salt accumulates near the bed and salt content is less near the surface). This is highly useful for water supplementation during the dry season, as well as for a strategy to control a brackish gradient along the river in 'common' circumstances. Intermittent flushing of saltwater (and sediment) can then best be done at another stage of the tide with the main gates that allow for high velocity undershot flow with a higher salt content. Moreover, such window-gates can allow for e.g. discharging floating waste and floating vegetation which would otherwise accumulate in front of the project. Obviously, all means to collect (and prevent) floating waste should be realised first before discharging it to the sea (hence waste collection at the project is also an issue to be identified in the ESIA, as stated above). A more widely varied operation of the project (so providing 'more robustness for operational freedom') may also require further provisions for the bed protection, such as the possible necessity of a stilling basin at the east side of each gate of the barrier.

d. To increase the dry season water volume, an option would be to store additional water within the Pan Hlaing River at a relatively high level during the tail of the monsoon, as part of anticipatory operational management. When an additional volume is secured in time at the end of the monsoon, part of this water will also be stored as river-related groundwater, which is beneficial for retarded release during the dry season, also avoiding evaporation losses.

For the present design and the proposed adjusted design, the ESIA needs to properly describe the environmental effects and mitigating measures for water quantity, water quality, sedimentation and biodiversity. This assessment needs to be made for the dry period, for the top of the monsoon (both as have been done), but also for at minimum two characteristic 'common' situations, e.g. one at the end of the monsoon period and one at the beginning of the monsoon period. The latter impact assessments can probably be done based on expert-judgement based on the quantitative studies carried out for the pre-monsoon and peak of the monsoon.

C. Assessment of impacts and comparison of the alternatives

In the methodology of this ESIA the following three shortcomings are identified:

- The ESIA is not clear about which of the following two baseline situations are used as reference situation (i) the present situation without the coffer dam including Mezali Sluice 2 or (ii) the present situation with coffer dam during the dry season including the Mezali Sluice 2. It is important to provide clarity when which reference situation is used in the ESIA.
- The description and presentation of the positive impacts of the project are in 6.1.2 mixed with the (negative) impacts. This causes inconsistencies in the impact assessment, with the consequence that e.g. table 6-1 provides wrong information.

- The ESIA does not present a comparative assessment of the alternatives and the main impacts, including mitigating measures. Presentation of this information in an accessible manner is crucial to facilitate the decision-makers.

- **Recommendations**:
  - After further consultation as baseline for the ESIA, the situation with cofferdam and Mezali Sluice 2 has been taken. The reasoning for this choice, as adequately shown in the Arcadis Memo of 23 September 2019, should be explicitly included in the ESIA.
  - Make a clear distinction between positive and negative impacts and adjust table 6-1.
  - Present a table in which a comparison is made of the main impacts for the identified four alternatives A, B, C and D, include the suggested project design as alternative E. Compare these alternatives with the defined reference situation in the same table.

D. Non-technical summary

The ESIA is a large and detailed technical document that in its current form cannot be easily understood by a non-specialist audience such as local communities that might be impacted by the project. The ESIA includes many technical terms and acronyms that are not always clearly explained. The (draft) Guidelines on Public Participation in Myanmar's EIA Process (2017) recommend that EIA reports should be accompanied by executive summaries that are written in a non-technical style using plain language. This is also a requirement of IFC Performance Standard 1.

- **Recommendation:** The ESIA should include a non-technical (executive) summary that higlights and presents the key findings in a style, format and language (English and Myanmar) that is easily understandable for all stakeholders. The ESIA should include at least a comprehensive list of acronyms and abbreviations. In addition, the NCEA recommends including a glossary where some of the key terms used in the report are briefly explained in a non-technical language.

E. Stakeholder Engagement Plan

The ESIA does include a Stakeholder Engagement Plan but it is incomplete, and part of the information is presented in another report.

- **Recommendation**: The Stakeholder Engagement Plan needs to be elaborated according to the IFC PS and included as part of the ESIA. In section 3.1.2. more guidance is provided to develop and complete this plan.

3. Review against IFC Performance Standards

The ESIA sets out that IFC Performance standards (IFC PS) 1, 2, 3, 4, 6, 7 and 8 are triggered, 5 is potentially triggered.

The NCEA has reviewed the ESIA against each of the IFC PS. In the following sections, the key objectives of the respective IFC PS[1] are presented in a box followed by the identification of shortcomings and recommendations.

To comply with the IFC-PS, the NCEA recommends remedying all these shortcomings in a further revision of the ESIA study or separate studies or plans.

3.1 PS 1-Assessment and Management of Environmental and Social Risks and Impacts

Key objectives PS 1:

- To identify and evaluate environmental and social risks and impacts of the project.
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise and where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment.
- To promote improved environmental and social performance of clients through the effective use of management systems.
- To ensure that grievances from affected communities and external communications from other stakeholders are responded to and managed appropriately.
- To promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

3.1.1 Environmental issues

Upstream flood risk reduction

The possibility of using the project to reduce increasing future upstream flood hindrance or damage in the Kokawa and upper Pan Hlaing rivers during high monsoon flows and heavy rainfall, e.g. in combination with high tides, has not been addressed. The discharge capacity of the project is enough to cope with additional high river flows (as long as the design discharge is not approached, which will be very rare). Such incidental 'forced' flow via the Pan Hlaing River downstream of Mezali Sluice2 may reduce flood risk upstream of Mezali Sluice2.

- **Recommendation**: the NCEA recommends to clearly mention the possibility of upstream flood risk reduction in the ESIA and to recommend this opportunity for further feasibility checking within a broader context at a later stage (as it is laying outside of the ESIA project area).

1 For a full description and explanation of the IFC Performance Standards: www.ifc.org.

Sedimentation of the Pan Hlaing River and seasonal reservoir

In the ESIA, the positive environmental effect of reduced sedimentation at the Pan Hlaing River by the presence of the project seems to be under-exposed. It is true that sedimentation without the project can be reduced by extensive dredging, but environmental (e.g. disturbance, carbon emissions), economical and practical restrictions may hamper sufficient dredging in the future. This may lead to significant reduction of the water storage capacity in the dry season. So, the presence of the project will, outside of the dry season, help keeping the Pan Hlaing River a free-flowing river also in the future with limited maintenance dredging. Together with e.g. increased water storage at the beginning of the dry season, the project will mitigate the strong sedimentation tendency whilst water depths will largely be maintained.

- **Recommendation:** The ESIA should emphasize the beneficial effects for the conservation of the Pan Hlaing River and elaborate on the improvement of water availability during the dry season. Such analysis may also give a clue to the usefulness of effective anticipatory operational management of the project in due time, e.g. capturing one of the last flood peaks at the tail of the wet season.

Bypass channel during construction

The construction sequence, including the realisation of a temporary bypass channel south of the Pan Hlaing River, is effective and logical. The bottom level of the bypass channel however seems somewhat too high (limiting temporary access for navigation and discharge of flood waters), which also leads to unnecessary use of space. The NCEA recommends considering an alternative narrower and somewhat more deepened bypass as being more effective and giving less impact on the environment.

- **Recommendation**: Indicate that the temporary bypass-channel dimensions should further be optimized during the detailed design, for which is a more smart design with a lower bed level may apply, as to reduce adverse impacts on the environment.

Operational management plan

An overall management plan for the operational management of the Mezali Sluice and the Pan Hlaing sluice is required to optimise the functional use of both sluices.

- **Recommendation**: Although it is not required to have an operational management plan in place as part of the ESIA or IFC PS it is recommended to start the development of this plan as soon as the detailed design is agreed upon. The development and especially the training of the staff responsible for operational management requires a long time period of training. A component of such a plan is the development of an emergency preparedness and response system, that needs to be operated in collaboration with relevant third parties.

3.1.2 Social issues

Impacts on Livelihoods

The Environmental and Social Management Plan (ESMP) included in the ESIA does not address mitigation measures (as reported in chapter 6 of the ESIA) on livelihoods, on sand and gravel businesses, on local vendors operating on the northern bank of the Pan Hlaing river and on

the shipyard on the southern river bank. Although the selected alternative with ship lock will allow the continued passing of boats, it is unclear if the sluice construction and operation will have any temporary or permanent residual livelihoods effects on these businesses. Similarly, the ESMP does not include any mitigation measures for the potential resettlement of the (small group of) informal settlers near the proposed sluice location.

- **Recommendation**: The ESMP should include all potentially negative social impacts, including temporary ones during the construction of the sluice, and the mitigation measures needed to address such impacts. In case impacts are not yet certain, as this is the case for specific livelihoods and resettlement impacts, the ESMP should at least recommend that further relevant investigations will have to be conducted (for example as part of the Technical Basic Design study) and appropriate measures be taken once the results are clear.

Public consultation and disclosure

The chapter on Public Consultation and Disclosure states that all stakeholder activities during the (ESIA) Scoping phase are excluded from the ESIA as they have already been presented in the ESIA Scoping Report to the authorities. However, this document is currently not publicly accessible (not required under Myanmar's EIA Procedure 2015). Similarly, the ESIA refers to a Stakeholder Engagement Plan, which is part of the Inception Report (Feasibility Study, Environmental and Social Impact Assessment and Basic Design for the Pan Hlaing Sluice, 2018).
Moreover, the information in the ESIA on public consultation and disclosure is incomplete.

- **Recommendation**: In the interest of transparency and meaningful consultation, the ESIA should reflect the views expressed by stakeholders (in particular affected communities and businesses) during the entire ESIA process, including the ESIA scoping phase. Therefore, the ESIA should at least include information on:
  - all meetings held with local communities and other stakeholders, in the schedule as well as the issues raised;
  - indicate whether separate meetings have taken place with (i) which social groups, women and other vulnerable groups and (ii) what focus groups and (iii) community sessions have taken place;
  - how/where/when the draft ESIA was disclosed and how relevant non-institutional stakeholders (incl. affected communities and civil society) were informed about its disclosure.

Stakeholder Engagement Plan

A Stakeholder Engagement Plan (SEP) is no requirement of the Myanamr EIA regulation but is a requirement of IFC PS 1. According to PS 1 the SEP needs to be in place but as a separate plan to the ESIA.
In the ESIA reference is made to the SEP that is part of Chapter 4 in the Inception Report; Feasibility Study, Environmental and Social Impact Assessment and Basic Design for the Pan Hlaing Sluice, 2018. The information presented in this Inception Report is a stakeholder analysis and that is a first step in the preparation of an SEP however (draft) SEP is not yet available.

- **Recommendation:**
  The ESIA needs to:
  - Acknowledge the existence of the stakeholder analysis as a result of early stakeholder engagement and described in the Pan Hlaing River Integrated Development Plan (PHRIDP, 2015). This stakeholder analysis provides useful information about stakeholder interests and requirements (what people would like to see in the project).

  Future community engagement would benefit from a complete SEP that needs to be in place before public disclosure of final ESIA and that addresses the following issues:
  - Develop a communications and/or stakeholder engagement register (in Excel or other software) to keep track of all stakeholder engagement activities and key issues raised / requiring follow-up. A high-level summary of this register could be included in the ESIA under the Schedule of stakeholder activities.
  - Indicate whether the potentially impacted informal settlers immediately downstream of the proposed project site location have been consulted separately. Considering the potentially unique impacts (incl. loss of access, noise/dust and fishing impacts) a separate consultation meeting with these local stakeholders is recommended.
  - Indicate whether the different options, incl. positive/negative impacts, have been presented to all stakeholders including engagement with affected communities during consultation activities and take note of their feedback.
  - Indicate how long in advance the public meetings were announced and provide information on the total number of people (with breakdown between men/women) that attended the public meetings in each village.
  - Clarify if the issue of gender-differentiated project impacts was raised/discussed during the focus group discussions and/or public consultation meetings. Indicate whether certain riverine livelihood activities (farming, fishing, sand/gravel transport, retail trade, etc.) are predominantly conducted by men or women, and what the potential effect of the project on their ability to continue/expand these activities.
  - Indicate if and how the public consultations organised during the ESIA ensured inclusiveness and effective participation of affected communities, incl. disadvantaged and vulnerable people.

Grievance mechanisms

The ESIA makes reference to a grievance mechanism, but does not clearly state if this already exists, how it will operate and how stakeholders can access it. The development of an effective project grievance mechanism that is easily accessible to all stakeholders is a widely accepted best practice.

- **Recommendation:** The ESIA should clarify if a project grievance mechanism already exists. Although the details can be included in the Stakeholder Engagement Plan, it is recommended that the ESIA includes at least summary (contact) information about where, to whom, and how complaints and other questions related to the project can be submitted.

3.2 PS 2 - Labour & Working Conditions

Key objectives PS 2:

- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To establish, maintain, and improve the worker-management relationship.
- To promote compliance with national employment and labour laws.
- To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain.
- To promote safe and healthy working conditions, and the health of workers.
- To avoid the use of forced labour.

The project will mobilise a workforce that warrants careful impact and risk assessment with attendant policies on human resources (recruitment, welfare, protection), child labour and gender, and which will relate to local legislation and regulations as well as to this Standard.

The section on Policy and Legal Framework (section 3.1) mentions that there will be respect for labour rights (e.g. non-discrimination, equal opportunity, fair treatment, avoidance of forced labour) and promotion of safe and healthy working conditions for the workers that will be involved in the construction of the project. The ESIA also mentions that specific care should be taken to protect vulnerable categories of workers such as children and migrant workers, and that an occupational grievance mechanism will be implemented.

- **Recommendation**: The ESIA / ESMP needs to include standards and elaborate measures how to manage potential impacts on labour and working conditions.

3.3 PS 3 - Resource efficiency & Pollution prevention

Key objectives PS 3:

- To avoid or minimise adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.
- To promote more sustainable use of resources, including energy and water.
- To reduce project related GHG emissions.

The project will make use of natural resources like, water, sand, limestone/cement and will use energy.

In NCEAs first advice (March 2017) it was suggested to assess the installation of flow turbines behind the sluice gates to make the sluice self-sufficient with zero-emission energy generation. The ESIA makes no further reference to this suggestion, but the NCEA notes that this option has been considered in a separate Inception Report for the project d.d. 14 July 2018 and found to be not cost-efficient.

- **Recommendation**: The option of the use of solar power needs to be assessed in order to make the sluice self-sufficient in energy.

3.4 PS 4 – Community Health, Safety & Security

Key objectives PS 4:

- To anticipate and avoid adverse impacts on the health and safety of the affected community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the affected communities.

The project is anticipated to have adverse impacts on community health and safety, but these are adequately addressed in the ESMP in terms of scheduled mitigation plans, for example via a vector-borne disease control plan and an emergency preparedness and response plan.

3.5 PS 5 – Land Acquisition & Involuntary Resettlement

Key objectives PS 5:

- To avoid and, when avoidance is not possible, minimise displacement by exploring alternative project designs.
- To avoid forced eviction.
- To anticipate and avoid or, where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected.
- To improve, or restore, the livelihoods and standards of living of displaced persons.
- To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.

A Resettlement Action Plan (RAP) is required if people are physically and economically displaced. A Livelihood Restoration Plan is required if people are only economically displaced.

As the project may entail economic and physical displacement, this will require in-depth consultation with project-affected people, a negotiated approach to alternative housing and livelihood restoration options, compensation at full replacement costs, and access to a grievance mechanism to address and seek to resolve disputes quickly and satisfactorily. This includes project-affected people who may not have formal rights, such as informal settlers and farmers.

Physical and economic displacement

The ESIA indicates that there is a small number of informal settlers who recently settled near the proposed project site and states that the design of the sluice will strive to avoid resettlement as much as possible. The ESIA also notes that the Yangon Regional Government has developed plans to relocate informal settlers from the Hlaing Thar Yar industrial area and northern bank of the Pan Hlaing river to the southern side of the river, where the New Yangon City is planned. Although the ESIA clearly states that this relocation of informal settlers is not related to the Pan Hlaing Sluice Project, it acknowledges there could be induced impacts.

The ESIA also indicates that some groups might (temporary) economically be displaced such as fishermen.

- **Recommendation**: The ESIA should specify more clearly if the recent informal settlements near the proposed sluice location will be affected by the project or not. If they will be affected by physical displacement, a Resettlement Action Plan (RAP) will have to be developed. If they will not be affected by the project such a plan is not required. In that case, the RAP will have to include (i) a gap analysis and supplementary measures, (ii) compensation for lost assets for landowners, (informal) land users at 'full replacement costs' (i.e. market value + transaction costs + relevant transitional allowances), and (iii) support for livelihood restoration. In case of people who are affected by economic displacement only, a Livelihood Restoration Plan should be developed.

  In addition, the ESIA should recommend close coordination between the project proponent and the Yangon Regional Government with regard to the resettlement of other informal settlers in the project's area of influence to ensure that this process is conducted in line with national and international standards.

3.6 PS 6 – Biodiversity Conservation & Sustainable Management of Living Natural Resources

Key objectives PS 6:
- To protect and conserve biodiversity.
- To maintain the benefits from ecosystem services.
- To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

According to the ESIA PS 6 is triggered. The effects of the project on biodiversity and sustainable management of the Pan Hlaing River are already considered under PS 1.

3.7 PS 7 – Indigenous People

Key objectives PS 7:
- To address the need to avoid or minimise impacts on indigenous peoples.
- To ensure sustainable and culturally appropriate development of benefits and opportunities.
- To ensure Free, Prior and Informed Consent (FPIC) of all peoples.

According to the ESIA PS 7 is triggered. The ESIA indicates that ethnic minority groups are living in the Pan Hlaing area 2. However, the ESIA describes that the project does not differentially impact these groups and therefore impacts on these groups are not discussed separately in the ESIA.

Recommendation: Whether IFC PS7 is triggered does not only depend on 'differential impact' on indigenous peoples. To comply with PS7, impacts on indigenous people ('ethnic minority

groups' in Myanmar) need to be further investigated, which may require an expert opinion on indigenous people presence/impact.

3.8 PS 8 – Cultural Heritage

Key objectives PS 8:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation.
- To promote the equitable sharing of benefits from the use of cultural heritage.

According to the ESIA PS 8 is triggered. The ESIA describes the impacts on cultural heritage to be positive in case of the alternatives A and B (location of the dam in the downstream part of the Pan Hlaing river) because the accessibility to some cultural heritage sites is expected to be improved.

Although negative effects on present cultural heritage sites are not expected, construction activities at the project site might affect unknown cultural heritage sites. Therefore, it is recommended as part of the mitigation measures to develop a 'chance find procedure' that needs to be incorporated in EPC/subcontractor contracts.