Challenges for Climate Change Resilience and Adaptation in EIA of Myanmar

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1. Introduction

Climate change is a catastrophic threat for ASEAN countries, where multiple natural hazards are exposed, and people are suffering from the consequences of it (1). Myanmar is one of the countries worst affected by the climate change. According to Global Climate Risk Index (2021) (2), Myanmar is the second most affected country by extreme climate events over the last two decades (from 2000 to 2019). Since 2009, Myanmar tried to improve its participation in global efforts to mitigate climate change and incorporated it in the relevant plans, policies, laws, and regulations, as described in Figure 1.

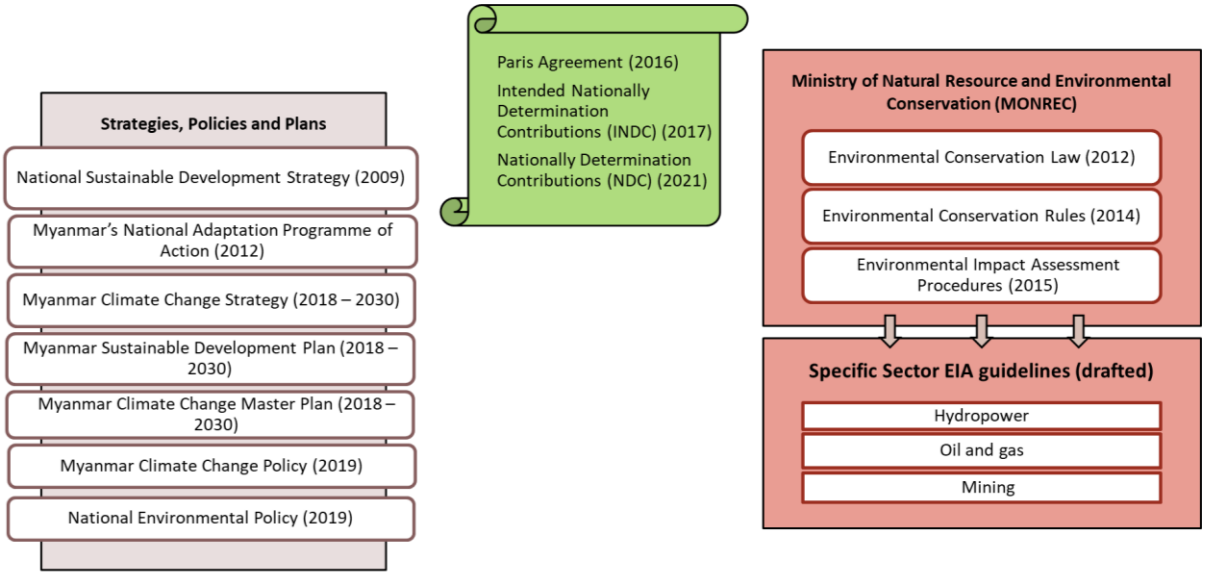

Figure 1 Strategies, Policies, Plans, Laws, Rules, and Regulations in Myanmar that Climate Change is Incorporated

Environmental Impact Assessment (EIA) is one of the planning and decision-making tools that provides information on the potential impacts of the development projects, through which, climate change issues could perhaps be addressed. Although fundamental laws, rules, procedures, strategies, and plans are in place, climate change consideration in the Impact Assessment is still not adequately integrated in the EIA system of Myanmar (3).

While exploring the international approach on this goal, it is noticed that in the UK, Institute of Environmental Management and Assessment (IEMA) published a framework document entitled "IEMA ENVIRONMENTAL IMPACT ASSESSMENT GUIDE TO CLIMATE CHANGE RESILIENCE AND ADAPTATION" in 2015 (revised in 2020), which particularly indicated that the actions should be taken to integrate climate adaptation and resilience issues in the UK's EIA process.

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In this paper, desktop studies have been performed to understand the gaps between climate consideration in Myanmar's EIA system and the referred IEMA's guideline. Then, the potential rooms for the improvement of Myanmar's EIA system with climate change consideration are figured out.

2. Legislative and Policy Setting

In the UK, consideration of climate change into the EIA process is based on EU Directive 2014/52/EU, which was transposed into UK law by the Town and Country Planning (EIA) Regulations, 2017. The schedule IV of the law prescribed not only the requirement of assessing the impact of the project on climate but also the vulnerability of the project to climate change.

In Myanmar, the EIA Procedures (2015) serves as the basis of EIA system. Related with climate change, these procedures require EIA report to include the description of the surrounding climate and identification and assessment of the project's potential impacts on climate change as well as the impacts of climate change on the project.

In contrast, principal consideration of climate change in the EIA regulations in UK and Myanmar are generally similar. However, specific technical guidance on climate change consideration in Myanmar EIA process is still not developed yet and consequently, EIA reports for development projects are being submitted without sufficient assessments on climate change resilience and impacts.

3. Approach for Addressing Climate Change Issues in Myanmar

In Myanmar, the drafted three specific sectoral EIA guidelines for hydropower, oil and gas, and mining (the prioritized sectors of the Climate Change Strategy) advise the assessment on climate change. In the mining guideline, it is recommended to consider the risks of natural hazards based on the future climate change scenarios but not directly referred to the vulnerability of the project due to climate change and impacts of project on the climate. Oil and gas guideline mentions assessment of climate change impacts, focusing on GHG emissions from oil and gas projects and adaptation of the climate change in project design. In contrast to the above guidelines, hydropower EIA guideline reasonably indicated the inclusion of climate change issues and requirement to assess the relevant risks and impacts. Therefore, this guideline will be used to compare with IEMA's guidance in the later section, along with the whole EIA process in Myanmar.

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4. Overview of IEMA's Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (CCRA)

IEMA guidance is composed of eight steps as illustrated in Figure 2, which provides a set of actions on how to integrate climate adaptation and resilience issues into the EIA process.

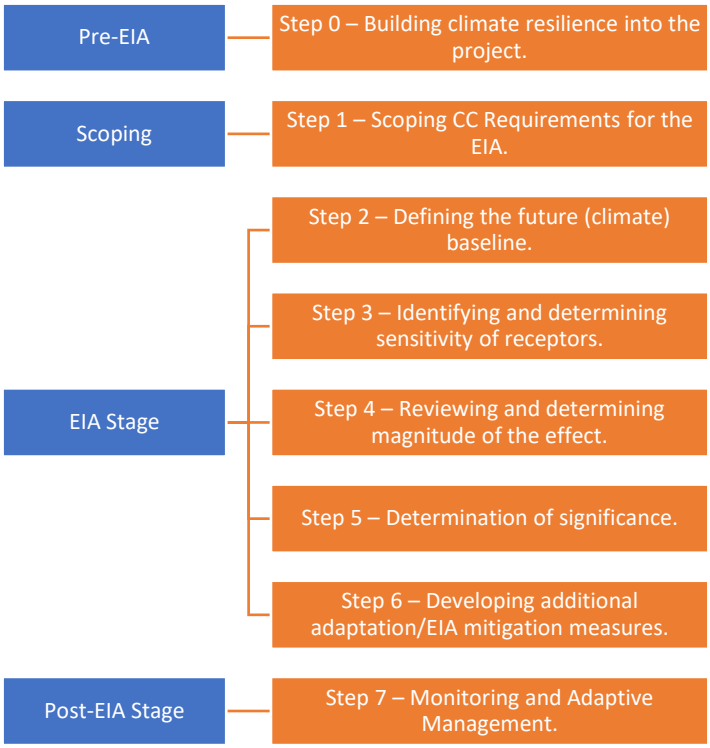

Figure 2 Eight Steps of IEMA's Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation

5. Gaps of Climate Change Resilience and Adaptation in EIA of Myanmar

Details on each step of IEMA guidance are presented by comparing it with both Myanmar EIA procedures and sectoral EIA guideline (Hydropower EIA Guideline) in Myanmar to investigate the gaps and challenges.

A. Step 0 – Building climate resilience into the project.

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
The resilience of the project to climate change impacts during the design stage can be done through delivery of a climate change risk assessment, or by following the principles set out in Steps 2 – 6. Resilience measures should be built into the project design.	There is no similar instruction.	This guidance recognizes climate change as an important design factor. Early consideration of environmental and social issues since conceptual / pre-feasibility phase of the project is recommended. It suggests undertaking environmental and social risks assessment, but no climate change

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IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
		risk assessment is required specifically.
If the project could be affected by climate change impacts or extreme weather events to such an extent that the project was potentially no longer viable, then the design should be changed, or the project stopped.	There is no similar instruction.	There is no definite description to change the project design or terminate the project based on the climate change impacts.
The outcome of the process of design for resilience needs to be properly reported in the final EIA Report: under the scheme description and consideration of alternatives, or in a climate chapter if a separate climate chapter is included.	There is no requirement for a separate climate chapter in the EIA report.	Identification of key alternatives and assessment of their environmental and social impacts are needed. Nevertheless, consideration from the viewpoint of climate resilience for selecting alternatives is still not clearly defined.

Note: In the pre-EIA stage of EIAP, there is only a screening procedure but no practice of conducting climate change risk assessment.

B. Step 1 – Scoping CC Requirements for the EIA

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
Agreement with key stakeholders on the most appropriate climate change projection to adopt for the assessment. Discussion about the exclusion of explicit consideration of climate adaptation and resilience issues if the project already contains adequate in-built consideration of adaptation and resilience issues in its design.	Not addressed.	Not addressed.
Identification of the scale and scope of the project's initial design, including the duration. Identification of climate-related parameters likely to influence the project, and anticipated changes to these climatic parameters over the lifetime of the project.	EIAP requires scale, scope, and time boundaries of project to be specified in the scoping stage. No guidance on identification of climatic parameters important to the project in scoping stage.	Similar with EIAP.
Identification of the potential impacts of the project on the receiving environment, the	The procedures guide only to identify project's environmental impacts but not the subsequent	Similar with EIAP.

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IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
sensitivity of this environment, and considering how this will be affected by changing climate.	consideration of changing climate on the predicted environmental impacts.	
Engagement with key stakeholders to identify the policies and regulatory regime regarding climate change in the project area.	Although EIAP requires to conduct a public consultation meeting in scoping stage, there is no detailed instructions for stakeholder engagement regarding climate change in the project area.	Similar with EIAP.
Assigning Climate Change Adaptation and Resilience (CCAR) Coordinator.	Not addressed.	Not addressed.

C. Step 2 – Defining the future (climate) baseline.

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
While identifying future climate baseline, using selected climate change projections, the practitioners need to consider a range of factors including extremes in short-term weather events, longer-term climatic variability, and changes in average climate norms. Source of climate information (set of climate projections) is available from UKCP18[3].	Although climate data is to be collected in EIA study, the requirement for addressing future climate baseline is not specified.	This guideline suggests to include the project area's climate patterns by describing historical weather observations, trends, spatial patterns, frequency, duration and intensity and the natural hazards. Moreover, it advises identifying potential hazards in the project's location according to the accepted future climate change projection data.

D. Step 3 – Identifying and determining sensitivity of receptors.

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
Climate Resilience Identify receptors within the elements of the project. Evaluation of the sensitivity of receptors by using a combination of their susceptibility and vulnerability in addition to value/ importance of the receptors.	Not particularly addressed about the climate resilience of the receptor.	It is recommended to identify sensitive receptors in assessing some impacts such as light, noise and vibration. However, determination of the climate resilience of the receptor in terms

[3] UK Climate Projections (UKCP) is a climate analysis and UKCP 18 delivers a major upgrade to the range of UK climate projection tools designed to help decision-makers assess their risk exposure to climate.

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IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
		of evaluating susceptibility and vulnerability is not specified.
In-combination Climate Impacts Collate the receptors identified relevant to the location, nature and scale of the project and the likely effects identified as part of the EIA. Evaluate the selected receptors whether the susceptibility and vulnerability as well as their value/ importance change with future climatic projections.	Although EIAP recommends considering the potential impacts on climate change and impacts of climate change on the project based on available climate change prediction, there is no precise guidance to examine the in-combination climate impacts on receptors.	Like EIAP, the guidance highlights about impacts on and from Climate Change. However, consideration of in-combination climate impact on the receptors has not been developed yet.

E. Step 4 & 5 – Determining the magnitude of the effect and significance.

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
Climate Resilience Review likely effects on the development associated with the climate change resilience. Consider probability and consequence to determine the magnitude of the effect. Determine the significance of the effect by using the sensitivity of receptors and magnitude of effect alongside professional judgement.	EIAP requires EIA projects to identify impacts of climate change on project based on the available climate change projections from designated national authorities or international scientific research bodies.	The guidance suggests assessing impact on and from the climate change.
In-combination Climate Impacts Collate the likely effects identified as part of the EIA. Consider the magnitude of the effects identified by other topics and evaluate whether the probability and/or consequence of the effect change with future climatic projections. Determine the significance of the effects of development on the receptors because of the changes in projected future climate conditions.	There is no guidance to consider the impacts on receptor because of the changes in projected future climate conditions.	Similar with EIAP, consideration of in-combination climate impacts on the receptors because of the changes in projected future climate conditions has not been developed yet.

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F. Step 6 – Developing EIA Mitigation Measures

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
Identify addition mitigation measures for fixed elements and project elements subject to maintenance/future change by climate effects. Prepare a Climate Change Resilience and Adaptation Plan.	Not particularly addressed.	Climate Change Resilience and Adaptation Plan is not additionally requested.

G. Step 7 – Monitoring and Management

IEMA's EIA Guide to CCRA	Myanmar EIAP	EIA Guideline for Hydropower Projects in Myanmar
Integration of the Adaptive Management in monitoring and management.	Not particularly addressed.	Not particularly addressed.

6. Challenges and Recommendations

For integrating climate change resilience and adaptation in EIA system of Myanmar, the following key challenges are observed and recommendations relevant to each challenge are described as below:

Challenges	Recommendations
Difficulties in Application of Climate Change Adaptation in Myanmar EIA Process	Myanmar EIAP instructs to conduct EIA studies for more than 141 types of developments/projects/industries. In this case, it is important to ***clarify specific types of developments/projects /industries which will require climate change adaptation process*** as part of the EIA study.
Lack of EIA Review upon Addressing of Climate Change Issues	Although EIAP defines climate change as one of the factors for categorization of economic activities for assessment purposes, Environmental Conservation Department (ECD), MONREC, is still having the challenges in screening and reviewing of climate change impacts on and from the project. Consequently, most EIA reports approved by the MONREC were not assessing climate related impacts in their studies yet. ***Hence, it is suggested that the notification of an obligatory requirement of addressing climate change issues for particular projects likely affected by climate change should be imposed by ECD.*** The review body of the ECD should pay attention to integration of climate resilience measures and mitigation measures for in-combination climate impacts into the project.
Requirement of Climate Change Risk Assessment in Pre-EIA Stage	***Climate Change Risk Assessment*** before EIA process should be conducted to build climate resilience measures into the project design, particularly for climate affected sectors, ***when the sectoral guidelines are developed in future.***

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Challenges	Recommendations
Inclusion of Climate Change Consideration in Project Design	**Consideration of climate change** and **identification of potential climate change impacts** should be carried out since the scoping stage and similar specific instructions should be added to the scoping section of the EIAP.
Limited Availability of Climate Change Projection Data and Stakeholder Engagement	In Myanmar, availability of ***climate change projection data for specific location is limited, even in Asian Countries***, and the government organizations are still unable to provide those, although some national level information could be available from Department of Meteorology and Hydrology (DMH), Myanmar Information Management Unit (MIMU) and World Bank's Climate Change Knowledge Portal. The MONREC should consider the ***establishment of climate portal*** where, historical climate data and future climate change projection data are accessible by the EIA practitioners, probably with the support of DMH and other International Organizations. Besides, it is important to improve the capacity of the government staffs responsible for the climate portal as the climate change related data is complex and requires specialized knowledge and skills to collect, analyse, store, categorize and make accessible for the users. It would be beneficial if ***a topic related with climate change and climatic data projections could be included as one of the elements to be discussed with the public and the relevant stakeholders*** when a draft guideline on Public Participation in Myanmar's EIA Process (2017) is finalized.
Necessity of Additional Assessments	The additional assessments ***(Climate Change Resilience Assessment, In-Combination Climate Impacts Assessment)*** are necessary to integrate in the EIA process as guided in the IEMA's Guide.
Limited Capacity of EIA Practitioners in Myanmar.	It is also important that ***EIA practitioners (not only as the role of CCAR coordinator but as an EIA lead)*** should have the knowledge of climate change related baseline data, climate data projections and undertaking climate related risk assessments.
Integration of the Adaptive Management in monitoring and management.	***Adaptive management*** is the key to be successful in managing climate change related risks and impacts. Application of the adaptive management throughout the project life in post EIA stage will be a greatest challenge since typical monitoring and management for implementation of EIA is still not being practiced yet in EIA projects in Myanmar. Firstly, it is advisable to have more in depth / specific studies on the adaptative management practices of developed countries in addressing climate change related issues after post EIA stage. Secondly, the specific guidelines / instructions for application of the adaptive management should be developed in Myanmar EIA system based on the findings and recommendations from such studies.

Note: Further detail studies will be conducted.

References

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