## Stakeholder Comments

## Strategic Environmental Assessment of the Hydropower Sector – Final Report

## May 2018

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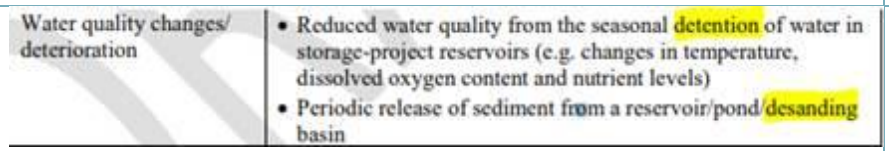
| **p28** | Table 6-1 summarises potential negative impacts. This table could also list out potential benefits for completeness (jobs and training, improved road and telecommunications, improved public services, benefit sharing, etc.). Several such benefits are listed on the following page as mentioned by stakeholders. | Thanks for the suggestion, positive impacts (or benefits) have been included in Table 6-1. |
| **p28** |  <br>"detention" or "retention" ? …. "desanding"? | Changed to 'retention'. Desanding basin is the correct term. |
| **p30** | Figure 6-1 text in graphic is too small to read. | Included the high-resolution version in the Final Report. |
| **p44** | Section 7.3 'Summary of BAU Development Impacts and Lessons Learnt' should also mention social impacts (e.g. resettlement) and conflict vulnerability as these feature prominently in the preceding basin-specific assessments. I see these issues are dealt with in more detail later (s8), but still good to include a mention in in s7.3 | Included sentence on social impacts in Section 7.3. |
| 23 | Environmental flow study is essential before decision of compliance for the study and assessment for Feasibility Study report. | Agree, that environmental flow requirements should be assessed during the feasibility studies.<br><br>Include 'assess environmental flow requirements' as part of pre ESIA or feasibility studies. |

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| 83 | Study Basin should be between the project study River Basin up to water storage a Dam or Reservoir. Whether the ratio of power installed is the same as basin or sub basin area? | Many of the sub-basins defined in the SEA using WWF hydrosheds level 6 have one more projects planned in a cascade. |
| 10 | Is it relied on tran-boundary water law , which is under proceeding by IUCN (Building River Dialogue and Governance (BRIDGE) if the river flows between two regions or left right banks are different regional authority .For example Meikhon River. | The SEA recommends that the mainstem rivers are free flowing. Global international good practice recommends project ESIAs to consider administrative boundaries within Myanmar and potential transboundary implications e.g. Thanlwin River in Thailand. |
| 89 | Environmental flow as well as water quality study should be done with internal specification and flow analysis such as flood control , flood hydrographs should be at least the return period of 10,000 Yr. | Agree, however this analysis is beyond the scope of the SEA and should be integrated into project ESIAs or CIAs (at a sub-basin or watershed level). |
| | Due to the Climate Change of present situation, the study of data base is from nowback to 15-20 years data base may be enough. | Project ESIAs should include climate change assessments for i.e. assessing the risks and opportunities of changes in average rainfall (wet and dry) and temperature (wet and dry). |
| | 1. Hydropower resource is one of the precious resources owned by the Republic of the Union of Myanmar and its people. How to use successful international experience to help Myanmar develop water resources to meet Myanmar's national development and people's needs for a better life is an important issue. It must be studied in a scientific, objective, fair, sustainable, and beneficial manner to the country and people of Myanmar. As to the hydropower development in Myanmar, including the development of water resources on major rivers, consulting agencies and companies from various countries have assisted Myanmar government in carrying out development planning and completed a lot of research work under the request and support of Myanmar government in the past years. Their outcomes have been modified and optimized by several generations during different periods, many of which represent advanced concepts of contemporary hydropower development and reflect the real needs of Myanmar. Some of the research work have already been applied to actual hydropower development work. The results of these predecessors' research should be sincerely respected. | The SEA fully agrees with your comment that Myanmar's water resources are important and that hydropower development is likely to be an important part of national development. The approach taken with hydropower planning prior to the SEA was project oriented, not based on the long-term sustainability / health of river basins which support major essential natural processes and the livelihoods of millions. The SEA approach involves balancing hydropower development in a river basin against maintaining natural processes and livelihoods - the two can co-exist. |

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| | 2. At present, hydropower is still considered to be the best clean energy. The World Hydropower Congress continues promoting the vigorous development of hydropower and has formulated hydropower development goals by 2050. The construction of reservoirs, dams and the use of good water resources to serve the country and the people has become a consensus all over the world. In United States, Luxembourg, Norway, Switzerland, Italy, France, Japan, and the United Kingdom, the utilization rate of water resources has reached about 80%. The successful construction of the US Hoover Dam is recognized as one of the important signs that promoted social and economic development of the time. However, in SEA report, a large number of qualitative statements and colorable views lead to a negative conclusion on the development of hydropower stations on the mainstream of Myanmar's major rivers. Without adequate quantitative analysis and balance analysis, these conclusions lack of correct and impartial guidance. | The SEA is seeking a balance between hydropower development and maintaining basin health and ecosystem services. Large scale hydropower projects proposed on mainstem rivers, particularly on the Ayeyarwady, Chindwin and Thanlwin, will create significant impacts and hence some projects have already been suspended by the Government of Myanmar (GoM). These impacts include: seasonal flow regulation; substantial sediment trapping; blocking of fish migration; substantial changes to river habitat on a large scale' and likely water quality changes. These impacts largely cannot be avoided by the scale of projects being proposed. |
| | 3. The development of a country's social economy cannot be achieved without electric power development. However it is developed, by hydropower, thermal power, gas, wind power, solar energy or others, it will more or less bring about problems in immigration, environmental protection, land issues, etc. during the development process. The SEA report only emphasizes the hazards of hydropower development and exaggerates its negative effects without comprehensive introduction to the positive aspects of hydropower development including improving infrastructure, increasing employment, stimulating economic growth, and earning foreign exchange through exports. Meanwhile, it fails to illustrate the existing mature measures to mitigate the negative impacts of hydropower development around the world. From this perspective, the report lacks of completeness and comprehensiveness. | The SEA acknowledges the need for power generation in Myanmar, and recognizes the advantages of hydropower over other forms of generation supplying the electricity grid. The SEA was undertaken to move environmental and social considerations to the front end of hydropower sector planning, essential in sustainable development planning. It seeks to tackle the big environmental and social issues, many of which can only be handled by developing some areas and avoiding development in other areas. Impact mitigation measures only go so far towards reducing the impacts of large scale hydropower projects. |
| | 4. Regarding Mong Ton HPP mentioned in the SEA report, it was precisely for the consideration to reduce the environmental and social impact of the project that the Ministry of Electricity and Energy (MOEE) of Myanmar and the project developers of Mong Ton HPP negotiated rounds to modified the project development scheme from one-cascade to two-cascade (Mong Ton + Wan Gan) | The SEA takes a system view rather than focusing on individual projects. It does this in recognition that the health of a basin or mainstem river is dependent on mainstem processes and a balance in sub-basin utilization. To inform this system level view, the SEA considered the type, |

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| | by scientific comparison and demonstration. By significantly reducing the environmental and social impacts, the two-cascade project scheme has been approved by MOEE of Myanmar and supported by Shan State Government. However, the data and conclusions in the SEA report do not reflect the true picture and need to be verified. | scale and distribution of hydropower projects (existing and proposed) to understand the likely impacts on basins/rivers/livelihoods.<br><br>Regarding Mon Ton redesign, information was extracted from the EGAT website on the redesign – the results of the assessment appear to be confidential as no details are publicly available. From your comment the overall impacts have been reduced, but if the redesigned projects will still substantially regulate river flows, trap most sediment, prevent fish migration, change large areas of aquatic habitat, etc. then Thanlwin mainstem processes and functions will be compromised. Mention of the potential re-design is included in the Final SEA report. |
| | Throughout the entire report, it gives the impression that "Environment Protection far outweighs Development". No matter how significant benefits water resources development can bring to Myanmar country and its people, hydropower development could be easily denied for the sake of environmental protection.<br>In addition, most current hydropower projects in process in Myanmar have gone through the signing of cooperation or development agreements, the developers of which have invested considerable amount of time and money on project research and development at different depths. If all the development activities should be terminated in accordance with the SEA report, the SEA report should also suggest a solution on the settlement of these issues and make a reasonable assessment | The SEA does not deny hydropower, but seeks a balanced view. In doing so it is neither pro nor anti hydropower, but recognizes the important role it is likely to play in meeting the generation shortfall in Myanmar and national development. The SEA also provides options for development in low and medium zone sub-basins to meet Myanmar's needs. |
| | **I. Comprehensively and objectively evaluate the hydropower development, fully recognize the comprehensive benefits of large-scale hydropower projects**<br><br>**1. Fully understand the huge comprehensive benefits of large-scale hydropower development and promote the experience of large-scale hydropower development in relevant countries**<br><br>Hydropower is only one aspect of the comprehensive development and utilization of a river, but HPPs are at the same time providing carriers for | The SEA does not seek to assess individual projects but to help to screen them based on overall basin health / sustainability considerations. |

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| | comprehensive utilization. It is necessary to fully evaluate the comprehensive utilization benefits of hydropower, such as flood control, irrigation, shipping, water resources management, land management, cultural protection, environmental protection, promotion of economic and social development, etc., and bring many benefits in terms of infrastructure improvement, employment rate improvement, improvement of living conditions of local residents, and improvement of social welfare such as medical education.<br><br>From the world's hydropower development practices and experiences, most of the major rivers in developed countries have river basin controlled projects, such as USA, Europe, and China. Not only providing clean, renewable and low-cost hydropower resources, but also large-scale river basin controlled projects are indispensable for the comprehensive management of river basins in large-scale rivers, especially for solving flood control problems in large rivers. USA's Tennessee river basin, USA's Mississippi river basin, Europe's Rhine river basin, China's Yangtze River, Yellow River, Qiantang River Basin, etc. are all successful examples of comprehensive management of river basins. They are all planning and building a series of controlled projects on the mainstream of rivers, taking into account non-engineering measures, with the comprehensive development and management of river, so as to achieve the maximum comprehensive benefits, such as flood control.<br><br>At the World Hydropower Conference in May 2015, IFC's CEO's statement mentioned that hydropower is a stable and affordable environment-friendly power source that can stimulate economic development, create jobs, and create an ecosystem. From 2005 to 2015, IFC invested more than US$1.3 billion in 42 hydropower projects in countries related to Asia, Africa and Latin America. In the future, IFC will support cross-border hydropower projects in Nepal, Bhutan and Laos. | |

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| | We also noticed that the World Bank and IFC have promoted and funded several large hydropower projects over the years. The World Bank and IFC have vigorously promoted the Grand Inga hydropower development in Congo in Africa. These hydropower plants are on the mainstream of the second largest river in Africa - Congo River and the planned installed capacity is 40GW. In 2014, the World Bank has provided US$73 million for the expansion of the Grand Inga Power Station to fund project research. In the same year, the World Bank also provided a US$600 million interest-free loan for Pakistan's Dasu HPP, which is the second-tier HPP on the mainstream of the Indus River with an installed capacity of 5.4GW and a dam height of 233 meters.<br><br>We highly appreciate the efforts made by the World Bank and IFC to promote the above-mentioned large-scale hydropower projects. We hope that IFC will promote the experience of large-scale hydropower development in Myanmar. | |
| | **2. Hydropower development is widely implemented worldwide, and it has accumulated rich experience, modern engineering technology can effectively control the negative impact of hydropower development**<br><br>By the end of 2016, the world's total installed power generation capacity was approximately 6.0 billion KW, including installed hydropower capacity of about 1.246 billion KW, accounting for 19% of the world's total installed capacity. Countries with abundant hydropower resources give priorities to hydropower development. The development rate of water resources exceeds 80% in such countries as the US, Luxembourg, Norway, Switzerland, Italy, France, Japan and UK.<br><br>With the accumulation of experience in hydropower development, the reliability and safety of power plants have been continuously improved, and comprehensive management projects and measures for environmental protection and ecological protection have been increased. At the same time, l**ocal ecological impacts can be effectively controlled or mitigated through** | Conventional hydropower development usually states the benefits of hydropower, but rarely states the impacts on sub-basins and basins. The SEA has been prepared to fill this gap related to basin and sub-basin impacts.<br><br>Modern technology cannot avoid or mitigate some major impacts of hydropower. e.g. Thanlwin River coarse sediment will not pass through the extended reservoir. |

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| | **modern engineering and non-engineering measures**. For example, through the integrated management of the Rhine by European countries, the Rhine has been restored to the level before the World War II in terms of the ecological environment and biodiversity. It is particularly noteworthy that no hydropower dam has been demolished during the integrated management. This indicates that it is completely possible to control the adverse impacts of hydropower dams on the ecological environment to an acceptable level.<br><br>The SEA Report gives an overall description of the disadvantages and adverse impacts of hydropower development, but says little about the positive aspects of hydropower development, and even less about proven measures which are currently available in the world for reducing the adverse impacts of hydropower development. From this point, the completeness and comprehensiveness of the SEA Report need to be improved. This is inconsistent with the original intention of preparing the report. | |
| | **3. River basin controlled hydropower projects are a necessary means for the comprehensive management of major rivers in Myanmar and will promote economic, social and environmental and sustainable development**<br><br>Myanmar has about 50GW hydropower resources that can be economically developed, mainly concentrated in the Ayeyawady, Salween, Sittang, and Chindon rivers. The abundant hydropower resources are a precious asset endowed by nature to Myanmar and should be obtained properly and fully. If irrational restrictions are imposed on the above-mentioned river basin hydropower development, it will not only result in serious waste of resource endowment, but more importantly, it will not be able to achieve comprehensive river basin management of large rivers and achieve the purpose of benefiting people.<br><br>For example, the Ayeyawady River, under natural conditions, has problems such as flood disasters, droughts, large swings of rivers, and man-made ecological damages, which are detrimental to the health of rivers and are not conducive to | The SEA is seeking a balance between hydropower development and maintaining basin health and ecosystem services. Large scale hydropower projects proposed on mainstem rivers, particularly on the Ayeyarwady, Chindwin and Thanlwin, will create significant impacts and hence some projects have already been suspended by the Government of Myanmar (GoM). These impacts include: seasonal flow regulation; substantial sediment trapping; blocking of fish migration; substantial changes to river habitat on a large scale' and likely water quality changes. These impacts largely cannot be avoided by the scale of projects being proposed.<br><br>A follow up study to the Ayeyarwady Integrated River Basin Management Project (AIRBMP) using a hydrological model for the whole basin showed that there is limited potential to use reservoirs for flood control. Maintaining seasonal flows and natural processes are important to support floodplain agriculture, fisheries and delivering sediments and nutrients to the Delta and coastal areas. |

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| | the well-being of the local people. According to the analysis of remote sensing surveys, in the past 40 years, the middle and lower reaches of the Ayeyawady River have fluctuating swings, and the maximum swing distance has reached as much as 7 kilometers, which is unfavorable to the stability of the river banks and has also caused serious damage to the local people. In 1979, severe flooding occurred in the Ayeyawady River. The highest water level in the Myitkyina section exceeded the limit of 211 cm, which lasted for seven days, causing heavy casualties and property losses. Other traditional lifestyles and industrial developments such as burning cropland, gold panning, deforestation, and wildlife trade also threaten the ecological health of the river basin. By rationally planning and constructing large-capacity hydropower projects in the upper reaches, such as the Upstream Ayeyawady Hydropower Projects, it is of great significance for the scientific management of Ayeyawady River and the comprehensive utilization of water resources, which will be beneficial to the health of the river and will fully exert its economic, social and environmental benefits in many aspects.<br><br>According to the conclusion of the SEA report, the mainstream of major rivers in Myanmar is not suitable for the construction of river basin controlled projects, which means that the major river basins such as the Ayeyawady River in Myanmar are in a natural state and cannot be comprehensively managed and developed. In this way, flood prevention in related areas cannot be solved, and Myanmar's main hydropower resources cannot be developed. This not only affects the local socio-economic development of related river basins, but also does not help Myanmar to fully utilize its own resource advantages. | |
| | **Ⅱ. ACHC conducted a systematic investigation and scientific research on the environmental impacts of the Ayeyawady River. It is recommended that relevant work results be used for reference to improve relevant contents of the assessment of Upstream Ayeyawady Hydropower Projects** | The SEA team did not receive any information on the EIA completed in 2009–10 and this information is not publicly available to be included in the SEA or other relevant studies.<br><br>Recent studies undertaken at a basin level highlight the high number of endemic and migratory fish species, terrestrial biodiversity and remaining areas of intact forest in the Upper Ayeyarwady. Please refer to the State of |

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| | **1. The environmental research of the Ayeyawady River Basin is detailed and deep that could be examined**<br><br>ACHC has conducted the most detailed and in-depth environmental impact investigation and research work for the upper reaches of the Ayeyawady River. Through a large number of professional studies, the actual situation of the environment in the upper reaches of the Ayeyawady River was revealed, and the impact of project development on the ecological environment was fully demonstrated, and solutions and measures were proposed.<br><br>At that time, Myanmar had not yet promulgated environmental protection laws and environmental assessment standards, ACHC strictly abide by Myanmar's laws and regulations, and borrowed from the World Bank, Asian Development Bank and other relevant international environmental assessment standards and technical specifications, combined with the actual situation in the region, carried out the environmental impact assessment work systematically.<br><br>From January to July 2009, a total of more than 100 experts from China and Myanmar conducted site surveys in accordance with standards and norms. After a 7 month field survey in the upper reaches of the Ayeyawady River, a total of more than 8,000 animal and plant specimens were collected. On this basis, the experts of the two countries conducted discussions and exchanges on research findings, environmental and social impact assessments and measures for more than three months, and completed special study reports on terrestrial ecology, aquatic ecology, and environmental quality. In March 2010, China Changjiang Institute of Survey, Planning, Design and Research completed the *Environmental Impact Report of Hydropower Development in Upper Reaches of Ayeyawady River* based on the survey results from China and Myanmar experts and was officially approved by the Myanmar government in January 2011.<br><br>The main conclusions include: The hydropower development of the River Basin is an effective way to solve the ecological problems, and the project construction | Basin Assessment (SOBA) synthesis report and technical volumes: http://www.airbm.org/the-ayeyarwady-state-of-the-basin-assessment-soba/<br><br>It is also not clear whether the EIA conducted considered social impacts, especially considering that armed conflict has escalated in Kachin and Northern Shan states as pointed out in the SEA Baseline Chapter on Peace and Conflict. |

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| | is beneficial to the social, economical, and environmental improvement in Myanmar and Kachin State; There are no environmental constraints, the hydropower development in the upstream Ayeyawady River is feasible in terms of environmental impacts. | |
| | **2. Comments on the assessment of the hydropower projects in the upstream Ayeyawady river basin in the SEA Report**<br><br>1.During the SEA, except the small public consultation meeting in Myitkyina, no detailed and thorough field investigation has been carried on the environmental and social conditions of the Ayeyawady Basin. The data for assessment are only sourced from some information available on the Internet, lacking sufficient scientific data for support. Only the environmental survey of the environmental research of the Ayeyawady Basin lasted for 7 months. A team of more than 100 experts from China and Myanmar and other 260 members surveyed the terrestrial ecosystem, aquatic ecosystem and the environmental baseline of the basin, and collected information on attitude of project-affected people on hydropower development, their concerns and requirements through public questionnaire survey. The assessment of the projects contained in the SEA Report lacks support from systematic investigation and thorough research and analysis.<br><br>2.According to the SEA Report, "the Ayeyawady Basin has a wide drainage area, flows through crystalline stratum, rock layer and steep areas, has abundant rainfall, and may transport a substantial volume of sediment to the Ayeyawady River", and scour may have major adverse impacts on the geomorphology and sediment content of the Ayeyawady Basin. According to the environmental impact assessment (EIA) of the Ayeyawady Basin and the assessment of the impacts on the downstream areas: 1) The Myitsone HPP, upon its completion, would detain sediment, and the sediment content of the released water would drop in a short term, and would achieve a stable level when a balance is achieved for siltation and erosion of the lower reach. The clean water discharged from the Myitsone reservoir may scour the downstream riverbed to a certain extent. But | The SEA aims to draw on publicly available scientific knowledge and stakeholder information gathered from a wide range of people across the Country. Many project EIAs are not disclosed to the public as per the Myanmar EIA procedures (2015). |

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| | considering that the about 200 km long Myitsone~Bhamo river section is located in an alpine-gorge area, and slopes along both banks are mainly composed of rocks, discharge of clean water has little impact on the downstream rocky slopes. For the remaining section downstream of Bhamo, the river banks will not be eroded due to restoration of sediment content to the natural level. 2) Activities in the Ayeyawady Basin are mainly sedimentation activities mainly along the middle and lower river sections. Upon the completion of the Myitsone HPP, due to enhanced sediment trapping and flow control in the reservoir area, the middle-to-lower reaches of the Ayeyawady River may have slighter sedimentation change and the more stable banks. 3) The river depth can be maintained in a long term by water retaining of the Myitsone HPP (water discharge in the dry season and storage in the wet season), to avoid repeated erosion of both banks. The Myitsone HPP would play an important role in prevention of water loss and soil erosion of the erosion. | |
| | 3.According to the SEA Report, "the Ayeyawady River has very high ecological value and is recognized as an important biodiversity area", and hydropower development in the basin may bring major adverse impacts on the aquatic ecology of the basin. However, according to the EIA of the Ayeyawady Basin: 1) Currently, the Ayeyawady River has good water quality in the upper reaches, has no industrial pollution sources on either bank, and is sparsely populated with little drainage of domestic wastewater. Upon completion of the cascade reservoirs, without any significant change of the existing pollution source, the increase of pollutants will be very limited in the reservoir area, and the water quality will not change obviously after dilution and degradation. The project development will barely influence the water quality. In addition, after completion of a large reservoir, through the water purification function of the reservoir, water quality of the river can be improved. Also, reservoirs formed by water storage for HPPs can also serve as main points of drinking water in various cities. Water quality of the reservoir of Xin'an River HPP in Zhejiang, PRC even meets the standards for Class I drinking water and "Nongfu Spring", a Chinese famous mineral water brand, directly source water from Xin'an River Reservoir at a depth of 70m.2) The dam, upon completion, may have certain impacts on | See above, EIA for the Upper Ayeyarwady was not publicly available and to our knowledge has not been updated since 2009–10. Under the Myanmar EIA Procedures (2015), separate EIAs would be required for each individual project and associated facilities.<br>The SEA also recommends Cumulative Impact Assessments (CIAs) are undertaken for cascade projects. Please refer to the IFC Good Practice Handbook on CIA: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_cumulativeimpactassessment |

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| | some migratory fish. Since most fish in the upstream Ayeyawady River is non-migratory, continuation of populations will not be influenced. There are only two migratory fishes, i.e. Anguilla bengalensis and Anguilla nebulosa, of which the main habitats and spawning grounds are distributed along the lower reaches. Upon formation of a reservoir, the quantity of some fish populations may have certain change. The quantity of lentic fish may increase significantly due to the expansion of the reservoir and more favorable conditions will be available for development of reservoir fishery. A range of aquatic ecological protection measures have been set out in the environmental management plan of the Ayeyawady River, such as strengthening protection of fish habitats, implementing closed fishing and fishing moratorium systems, and strengthening management of alien species and research on fish history, reproductive biology, behavioral ecology, habitat requirements, and artificial fecundation and releasing technologies. | |
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| | 4. According to the SEA Report, the Ayeyawady River Basin is one of the areas with richest biodiversity and is of high forest coverage; it is the habitat of many endemic species, with multiple wild life reserves. Therefore, the development of HPP in the river basin will have great adverse impact on the terrestrial ecology in the Ayeyawady River Basin. According to the environmental impact assessment research on the Ayeyawady River Basin, the reservoir will inundate certain amount of vegetation and animal habitats. Since most cascade reservoirs are in alpine and gorge regions and the area of inundated vegetation accounts for 1.4%% of that of the river basin, the impact of inundation is relatively small, and the population and biodiversity will not be significantly affected. In addition, the company will actively participate in and support the national park construction and regional ecological protection. Measures for terrestrial ecology protection are provided in the environmental management plan of the Ayeyawady River Basin: ex-situ conservation of rare plants inundated by reservoirs, environmental greening of project management area, strengthening of scientific research on terrestrial organism, and further investigation, assessment and monitoring of terrestrial biological resources. | See above, EIA for Upper Ayeyarwady not publicly available. |

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| | 5. According to the SEA Report, the development of HPP in the river basin will have adverse impact on livelihood of residents in the Ayeyawady River Basin. However, concerning the immigration for the projects, the investor, by collecting data related to local economy and society, has proposed overall planning for resettlement, produced typical design of resettlement area, tried to make the resettlement mode and compensation standard consistent with the local actual condition, and focused on the arrangement of livelihood, land allocation and reclamation, reconstruction of religious facilities, medical facilities, educational facilities, roads and other infrastructures. The resettlement of affected immigrants will change the production method and life style of most immigrants to a certain extent. However, the input of funds for hydropower development and construction, and the daily consumption of large number of construction personnel will promote prosperity and development of regional catering industry, service industry, entertainment and transportation industry, so as to provide certain amount of job opportunities for local residents and improve the living standard and quality of local residents. | It is not known whether social impact assessment (SIA) provisions were included in the original EIA studies from January to July 2009 particularly as armed conflict and violence has escalated in the Upper Ayeyarwady since 2011. |
| 35 | 6. On the Page 35 of the SEA Report, "Mainstem project development would cumulatively result in the direct loss of an estimated 1,235 $km^2$ of aquatic and terrestrial habitat. There will also be potential indirect impacts on an estimated 20,910 $km^2$ of Key Biodiversity Areas (KBAs) and 16,270 $km^2$ of intact forest." This part is about the hydropower station's impact on the terrestrial ecology, and it is also one of the main basis for the SEA report to classify rivers. There is no significant difference between the data of the cascade reservoirs and the published data on the accumulation of aquatic and land habitats of approximately 1,235 $km^2$. According to relevant published data, the primary forests in the upper reaches of the Ayeyawady River are mostly located at higher elevations. The normal water level of the Myitsone HPP is 245m, and the inundation vegetation area is about 360 $km^2$. The reservoir inundation area is subject to frequent human disturbances, and the reservoirs are mainly immersed in the secondary tropical mountain rainforest, the proportion of primary forest area is very small. However, the report included 20,910 $km^2$ of key biodiversity areas (KBAs) and 16,270 $km^2$ of virgin forests in the upper | Please see explanation of the Area of Influence (AOI) in section 8.5.1 of the report Recognizing that the impacts of hydropower are more localized, an 'area of influence' (AOI) approach can be used to assess social impacts, collect socio-economic data and design effective stakeholder engagement. The AOI can make use of higher resolution village tract and village-level population data and incorporate specific technical data for hydropower plants. The six AOIs of a typical HPP are illustrated in Figure 8-3. |

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| | reaches of the Ayeyawady River as potential impact areas and indirect impact areas. Actually, the Myitsone Hydroelectric Station had limited impacts on the above-mentioned 20,910 $km^2$ of key biodiversity areas and 16,270 $km^2$ of the original forest, the SEA report did not point this out. This concept was too general and there was a tendency to exaggerate and mislead. | |
| 35 | 7. On the Page 35 of the SEA Report, “Aquatic ecology and fisheries in the two headwater rivers, the Mali Hka and N’mai Hka, would be significantly impacted by the six large dams on these tributaries and the Myitsone HPP at the confluence of these rivers. The projects would create a series of reservoirs that would cumulatively flood an estimated 518 km of these major rivers, converting free-flowing aquatic habitat into a series of deep-water and slow-moving reservoirs separated by flowing river sections in places. These projects would also alter water quality due to the large volume of seasonal storage. Additional BAU development in the Dapein, Mali Creek, Ma Gyi Chaung, Myitnge, Namtabak, and Shweli sub-basins would unlikely cause significant changes on wider aquatic ecology as these areas are already substantially modified by existing hydropower development.” The SEA report directly shows that the implementation of the seven cascade hydropower stations in the upper reaches of the Ayeyawady River will have a significant impact on the aquatic ecology and fisheries of Mali Hka and N’mai Hka, without explaining the reasons and basis. The impact of hydropower station construction on river fishes needs to be investigated and studied through research on fish food organisms, species and composition of fish, migratory habits, resources, and important fish habitats (spawning grounds, overwintering grounds, and feeding grounds), combining with hydropower station reservoirs' adjustments to the hydrological situation, comprehensively determine the degree of impact. Obviously, the SEA report did not conduct in-depth investigations and studies and it concluded "significantly impacted." Such an assertion is obviously not objective enough and lacks meticulousness, pertinence, and scientificity. | As noted above, the Ayeyarwady SOBA 2017 highlighted the high number of endemic and migratory fish species, terrestrial biodiversity and remaining areas of intact forest in the Upper Ayeyarwady. http://www.airbm.org/the-ayeyarwady-state-of-the-basin-assessment-soba/ |
| | **III. Improve supporting materials and analysis, and correct relevant research conclusions** | The SEA is not intended to replace project-level EIAs or provide detailed information on the ground. It is intended to provide broad-level baseline information, sub-basin evaluations and perspectives of local people about |

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| | **1. Collect supplementary data and analysis, and learn from existing research results**<br><br>The SEA report lacks an in-depth investigation, research, and analysis of the status quo of hydropower development in Myanmar and its environmental impact. It only uses the existing literature data to study it macroscopically. There are problems with insufficient data and lack of specific analysis, resulting in the biases of relevant conclusions.<br><br>Many government agencies and consulting firms from various countries have helped the Government of Myanmar carry out systematic hydropower development planning, and made substantial research results. Over the past few years, many planning results have been implemented and new HPPs have brought actual benefits to socio-economic development of Myanmar. Among them, China Hydropower Construction Planning and Design Institute once compiled the *China-Myanmar Power Cooperation Plan* for the Myanmar government in January 2016. It also carried out relevant research on the development of hydropower in Myanmar and gave suggestions for reference. In addition, many government-approved hydropower projects, including the Ayeyawady Project, have engaged professional organizations to conduct environmental impact assessment studies. After thorough field research, relevant research reports have been formed and relevant contents are worth learning from. It is suggested that the SEA report completes the necessary supplemental collection of data and studies for relevant research results on an existing basis, and further enriches and perfects the content of the report. | Myanmar's key basins and sub-basins to improve national-level planning, hydropower project siting and decision-making.<br><br>The SEA recommends that all hydropower developers disclose information related to ESIAs and CIAs and comply with the Myanmar EIA procedures (2015) and international best practice for stakeholder consultation and social impact assessment. |
| | **2. Correct relevant research conclusions**<br><br>According to the SEA Report, it is suggested that river basin zoning plan be implemented, the development of hydropower projects in the Ayeyawady River, the Chindwin River and the main stream of the Thanlwin River be prohibited, hydropower projects in Myitsone and Mong Ton be stopped, and environmental impact assessment of most projects approved be reviewed. However, the necessity of river basin zoning and restriction on HPP development in the main | The SEA has not made a recommendation to review existing EIAs. However, based on international best practice there may be a need to update some of the older EIAs that were prepared prior to the Myanmar EIA procedures (2015) and the formation of the Ministry of Natural Resources and Environment (MONREC). Please check with MONREC. |

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| | stream are not supported by systematic scientific proof, the evaluation method is also should be further discussed.<br><br>It is known that many hydropower projects planned in the Ayeyawady River, the Chindwin River and the main stream of the Thanlwin River have been approved and implemented based on the demands of power development, and provided with legal supporting documents issued by the Myanmar Government, and relevant investors have input plenty of time and funds to various degrees. Up to now, Myanmar, through argument, research, discussion and practice in the historical course of hydropower development, has obtained experience in and capability of large-scale hydropower development based on the experience in hydropower development in the world. There are still deficiencies in the scientific, objective, and rigorousness of the relevant research findings of the SEA report, and it is recommended that it be further revised and improved.<br><br>In summary, we believe that this report has a certain positive significance, but there are still many deficiencies in many aspects. It is recommended that IFC and related report writers further improve and adjust the relevant content, and prudently complete the final research report. | Disclosing all existing EIAs and relevant data to the public would assist greatly in improving basin-wide information.<br><br>The results of the Myitsone Commission and further studies completed in 2017 have also not been made publicly available.<br><br>It is also worth noting that the Myitsone (6000MW), Tamanthi (1200MW) and other hydropower projects have either been suspended or cancelled by the GoM due to concerns around environmental and social concerns, prior to the development of the SEA. |
| 1 | **Overall coment**: this excellent work, to be commended. Particularly focus on whole system; ecological function, and stakeholders at earliest stage. congratulations | |
| 1, 3, 4 | **Overall comment**: the one oversight in the SEA is the failure to plan for the role of hydropower in overall energy mix. The first step should be an assessment of energy and water services needs, including particulary need for energy services to support grid and support renewable energy sources. With improved cost competitiveness of PV solar and wind, the question should be what is the best role of hydro to support a renewable future. This point is made in the RSAT, topic 2.1, for example. See also Hydropower Sustainability Assessment Protocol, Topoic ES-1 and P-3. | The SEA acknowledges that other renewables will play a role in the national power supply, but focuses on sustainability into the medium and large-scale hydropower segment of power supply because there is a need to handle the 69 medium–large projects currently being considered.<br><br>With so many planned projects, there was an urgent need in the hydropower sector to move away from the business-as-usual (BAU) project-centric approach driven by engineering and economic feasibility to consider the environmental and social and cumulative impacts at the earliest stage possible to deliver balanced hydropower development. |

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| | | The JICA supported power sector strategy is updating the National Electricity Master Plan (NEMP) and other follow-up studies are needed to assess the environmental impacts of the broader power sector and the role of other renewables (e.g. solar, wind, biomass). |
| 6 | Hydropower Sustainability planning purposes: This should also include assessment of energy and water services, to determine the best and necessary role of hydropower. | Agree, these assessments are recommended at the basin and sub-basin level through state of basin assessments (SOBA) or similar, river basin planning and other tools. |
| 21 | "However, the integration of utility scale solar may prove cahnllenging die to its intermittent availability and hencemay require hydropower-storage orojects to balance this variability in supply": This is exactly what should be assessed to define the best role for hydropower in meeting the need for energy services.<br>Moreover, the inherent limitation in the reliability in hydropower, particularly in the face of climate uncertainty and increased risk, should also be assessed. In monsoonal climates like Myanmar, there is a natural synergy between hydro and solar. When it rains there is lots of water; when it is dry there is lots of sun. What is needed is energy storage to fit the two together. Hydropower should be planned to address this need. | Power generation depends on inflows to the dam/reservoir, which mainly depends on rainfall. Future climate change assessments should be included in project EIAs and feasibility studies. |
| 22, 23 | "Due to its distinct wet and dry seasonal pattern, Myanmar experiences significant fluctuations in the supply of and demand for electricity. uThe existing base-load generation mix dominated by hydropower reaches peak capacity toward the end of the wet season and tails off during the dry season, resulting in shortages": This could be addressed if hydropower were specifically designed to provide grid stabilization support and support for deeper penetration of renewables, particularly solar. There is a natural synergy in a monsoonal system, between water availability in the rainy season and solar availability in the dry season. Hydro designed for ancillary services can help fit these two synergistic trends together | Agree, additional studies are currently being carried out by other development partners (e.g. World Bank, GIZ) on the national grid and also off-grid solutions. |
| 22 | Given the fluctuations in both supply and demand resulting from seasonal weather patterns (dry season shortages) have hydrologic alterations been examined in light of climate change? This possibility is mentioned on page 21, | Reference to climate change included. |

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| | but an analysis of potential hydrologic alterations due to climate change is not included. | |
| 33 | More explanation needed on how hydrology is measured. Is it potential regulation based on storage vs mean annual flow (Degree of Regulation)? If so, should be noted as an approximation of potential alteration – doesn't incorporate operations. | Noted. |
| 28-31 | This section is close to comprehensive and well done. The graphic with the frequency of issues identified by stakeholders is an excellent summary. A few suggested additions, but nothing major:<br><br>Suggest highlighting floodplain impacts from changes in flow – the connectivity to rivers, and the changes in timing, degree of inundation, length of inundation, sand frequency of inundation, all which are generally affected by dams which affect this connectivity, and the health of floodplains. Often there is an increase in low flows which results in lack of vegetation reproduction because floodplains need to have drier seasons for seedlings to sprout. Changes in flow patterns affect the uses of floodplains for fish spawning, bird uses, etc. In addition, changes in sediment dynamics affects nutrient dynamics of floodplains, which affect fish, birds, vegetation, etc. Such changes affect availability of wood and fiber, food. In addition, floodplains provide extensive services, such as improving water quality, providing water storage during high flow seasons, and carbon storage. When flow is altered, these functions can significantly decrease.<br><br>There can be increased transportation time around reservoirs as a social issue related to them.<br><br>Change in terrestrial and freshwater animal movements as a result of reservoirs – augment<br><br>Potential increases in malaria due to increases in standing water habitats, schistosomiasis (if occurs) due to loss of predators of snails from blocking migration. Solomon Kibret, Jonathan Lautze, Matthew McCartney, G. Glenn Wilson, and Luxon Nhamo. Malaria impact of large dams in sub-Saharan Africa: | Agree, floodplain impacts have been emphasized in Final Report.<br><br>The SEA acknowledges that fish passages have had limited success globally, however technology and research on fish passages for Myanmar's rivers needs to be completed.<br><br>The SEA recommends that connecting local people to electricity is included in benefit sharing mechanisms. |

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| | maps, estimates and predictions. Malar J (2015) 14:339. DOI 10.1186/s12936-015-0873-2. Sokolow SH et al. 2017. Nearly 400 million people are at higher risk of schistosomiasis because dams block the migration of snail-eating river prawns. Phil. Trans. R. Soc. B 372: 20160127. http://dx.doi.org/10.1098/rstb.2016.0127<br><br>Fish passages are generally poor mitigation solutions, their effectiveness tends to be low. Most people do not consider them a reasonable mitigation procedure.<br><br>Impacts/benefits – access to electricity may not result, since electrical grids often move electricity to industry and distant users. Cited examples here do provide electricity, so if this follows those examples, electricity will indeed be provided. The cultural changes associated with that are hard to quantify. The economic development may be limited and not accessible to those affected by development, basically benefit equity, which is something to always be aware of. | |
| 46 | **"Integrated Hydropower Planning":** Assessment of need for energy services and defining the role for hydropower should the first step | With the scale of planned hydropower development, the primary purpose of the SEA was to provide a first edition of the sustainable development framework (SDF) for hydropower in each major river basin in Myanmar, to improve project siting from the outset by considering the site-specific and cumulative environmental and socio-economic impacts at sub-basin and basin levels. |
| 47 - 25 | The description of the zoning for the river mainstem does not seem to explicitly take floodplains into account. The connectivity, functionality, etc., is focused on longitudinal connectivity with sub-basins and processes in the mainstem, which are true. It also does not address floodplain functionality and connectivity in the impacts from flow alteration. Not sure if this is an oversight or not, but floodplains are directly connected to flow and sediment regimes that mainstem dams would certainly affect them, and sub-basin alterations could significantly affect them through cumulative impacts even if any given sub-watershed was not resulting in significant sediment or flow alteration. While HPPs in sub- | While not explicitly mentioned, the floodplains and seasonal flow was covered as one of the indicators for geomorphology. Please refer so Sub-Basin Evaluation for further information on indicators and the methodology for ratings: https://www.ifc.org/wps/wcm/connect/f6aaa8d3-0954-4357-8648-bb5e5221d336/Final_Sub-basin+evaluation.14.02.18_Final+%281%29.pdf?MOD=AJPERES<br><br>A summary of scoring will be provided in the Annex of the Final Report. |

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| | watersheds might have more local impacts to sub-watersheds, their impacts on flow and sediment can have cascading and cumulative affects to the mainstem, floodplains, river delta, coastal areas, etc.<br><br>When discussing the sub-basin zoning and stating that the three driving biophysical features are geomorphology, aquatic ecology and terrestrial ecology, I would ensure that floodplains are described here as they affect the freshwater and terrestrial, and are affected by the geomorphology changes that occur.<br><br>The geomorphological changes that occur because of disrupted sediment delivery result in starved rivers, as indicated earlier in the document, resulting in down-cutting of rivers below dams. As a result, floodplains can become disconnected from rivers because they do not meander in shallow river channels after dam construction, as they become entrenched in an incised river channel. In addition, the fine suspended sediment that is naturally suspended in such stretches of river that were meandering, provide high levels of nutrients downstream. Once these channels become incised, that process breaks down, and the situation further contributes to lower fine sediment transport and can greatly lower nutrient transport – as the highest proportion of nitrogen and phosphorous are bound to fine sediment particles.<br><br>For the definition of high, medium, and low value zones for sub-basins, the description for the high value sub-basin includes important processes – flows and sediment contributions, which is fantastic. It is not clear whether the medium or low value can have important sediment and flow characteristics but lower ecological values – the descriptions only address the ecology values. The tables seem to indicate that sediment and flow are included, but the narrative does not. A concern here is whether sub-basins with low or medium ecological value that would have high flow and sediment contributions would be rated as medium or low, which would be a problem for downstream, main-stem habitats and biodiversity. It is not clear how values for each of the metrics – Geomorphology and sediment, Aquatic ecology, terrestrial ecology, are defined: How is a 1, 3 or a 5 determined? | The sustainability maps for each of the basins shows the opportunities for both mainstem reservation and free flowing sub-basins. |

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| | The smaller scale dams can, and probably do, have significant impact on bedload sediment, which drives the geomorphology to a great extent, and would result in down-cutting and high nutrient laden fine sediment resuspension to be lowered as a result. I would not under-estimate the impact that smaller dam projects have on sediment and geomorphology and subsequent sediment and nutrient regimes downstream.<br><br>The sub-basin categories in the map figure 8-2 result in a spatial matrix of high, medium, and low values for all of the major drainage systems. It would perhaps be better to have one or two completely avoided development river basins from headwater to mouth in order to maintain all habitats, processes, and migratory fish access along the continuum. This might be considered after looking at the sub-basin scores and defining complete rivers for avoiding dam development Breaking rivers up into these different categories, and avoiding development for a headwater that is then flowing into a main-stem river that has its floodplain and small lateral catchments rated as poor might result in development for important habitats. The lack of attention to floodplains and their continued functionality during flood seasons even in agricultural lands may be resulting in low value ratings even though they might serve a critical ecological function. | |
| 52-53 | It's not clear how the scores were assigned for each of the bins: geomorphology/sediment; aquatic ecology, terrestrial ecology. Qualitatvely based on expert opinion? Bins of quantitative metrics? Were all stakeholders involved in this process? How were final scores determined? | Please refer so Sub-Basin Evaluation for further information on indicators and the methodology for ratings: https://www.ifc.org/wps/wcm/connect/f6aaa8d3-0954-4357-8648-bb5e5221d336/Final_Sub-basin+evaluation.14.02.18_Final+%281%29.pdf?MOD=AJPERES<br><br>A two-day Stakeholder Workshop was held with government, CSOs, private sector and other stakeholders in August 2017 to review the draft indicators for sub-basin evaluation. The workshop followed an Advisory Group (AG) and a round of expert technical working group meetings (EGs) at the end of June 2017. |
| 61 | "Cascade Hydropower Development": And, importantly, it can provide for dispatchable, peaking energy and other ancillary services to support utility scale renewables. Together with planning for cascade operations, pumped storage | Agree, these options could be identified through other studies at a basin or sub-basin level as recommended in the SEA Final Report. |

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| | opportunities should be examined. For example, Yeywa existing reservoir would allow for a solar-hydropower hybrid with pumped-storage on (excellent) sites near existing works; I believe there is 300 to 500 Mw of firm capacity available with no more river impact. | |
| 64 | The Mon Tong dam, despite the anticipated redesign converting it to a cascade, will have signifianct impacts on the mainstem of the Thanlwin. Fewer, smaller dams is not a recipe for more sustainable dam infrastructure. The impacts to fish migration (and thereby freshwater fisheries and local liveliehoods) and sediment are still a concern. Recognizing that there are no details currently known about the project re-design, it would merit a point in this report suggesting how MOEE and MONREC will manage the potential development of this plan. | The information on the Mong Ton re-design was extracted from the EGAT website, however the results of the assessment appear to be confidential as no details are publicly available. The overall impacts may have been reduced, but the redesigned projects may still substantially regulate river flows, trap sediment, prevent fish migration, change large areas of aquatic habitat etc. then the Thanlwin mainstem processes and functions will still be compromised. The Mong Ton project is also planned in an area with high levels of current and historical conflict.<br><br>Mention of the potential re-design is included in the Final SEA report. |
| 64 | It is mentioned that seven projects will be exluded from the mainstem. First, can you make the statement that these are all the proposed mainsteam projects? Further, five of the seven are listed. Should the other two be listed as well? | The five mainstem project included in the SEA analysis are the Kunlong, Naopha, Mong Ton, Hutgyi and Ywathit. MOEE informed the SEA team and also NEWJEC the team preparing the updated NEMP that the Wei Gyi and Dagwin HPPs are cancelled.<br><br>Footnote included in the Final Report stating that the SEA team were informed by MOEE that the Wei Gyi and Dagwin HPPs are cancelled. |
| 64 | Applaud the inclusion of this point: Development on side streams (watersheds) in these 10 sub-basins may provide important<br><br>opportunities for renewable energy generation but should only be considered in accordance with yet to-be developed criteria restricting development to smaller scale, lower impact projects that cumulatively will not result in undue degradation of important processes and values in each sub-basin.<br><br>Further, worth mentioning the right role of hydropower here within a larger energy system. By encouraging the deployment of more renewable energy options (namely, solar), is more small-size, stream-located hydropower | Agree, further studies are required. |

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| | necessary? Can energy needs be met by more solar in areas developed adjacently to new or existing grids where existing storage hydropower could serve as reserve for solar's intermittency? | |
| 65 | Suggested revision: Hydropower development could be permitted in Low- and Medium-zone sub-basins when the GoM deems that a project is appropriate based on site, design, and operating and management regimes as these project characteristics relate to and impact the environmental and social values of the given sub-basin. | Revised. |
| 65 | Suggestion revision: Some of these projects may prove to be unfeasible for development due to economic viability, environmental and social risks, engineering difficulties, or other reasons… | Revised. |
| 67 | Regarding: With hydropower investigations in priority sub-basins, it is possible that capacity could be added over time. Does this report have the authority to encourage or commit to application of the SEA or at least principles of it when determining and identifiying future HPPs? | Yes, the SEA recommends that MOEE and MONREC commit to developing a sustainably hydropower policy and implementing the SDF. |
| 67-69 | I am concerned about the statement in the introductory paragraph on page 67 "Accordingly, socio-economic impact assessment needs to commence once a potential project site has been identified, ensuring that these issues are considered in decisions about final site selection, and project design.". It has been clear to those that are conducting basin-scale planning and understand the limitations of mitigation and compensation that such an approach often results in significant social impacts which could have been avoided if the sites were chosen using a system-scale approach up front. Once a dam location is chosen, there is little that can be done to mitigate social and livelihood impacts in sustainable ways – most approaches fail to some or a great extent, and can result in the destruction of cultures and livelihoods. There is indeed a large challenge with understanding the catchment-specific issues, but that is a challenge that should be addressed as part of the system-scale site planning that is needed to improve dam planning, and would go farther than the SEA approach does in general. | Agree that once a dam site is defined, there is no avoiding these social issues. The SEA recommends that preliminary E&S studies are also combined with feasibility studies to influence design and siting of projects. CIA can also be conducted in sub-basins with and without existing projects.<br><br>The SEA recommends that further socio-economic studies are consolidated through the AIRBM river basin master planning process and other studies to be conducted in the Thanlwin and other basins. Other studies will also improve the socio-economic information at a basin or sub-basin level. |

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| | The AOI is a very good approach, and one that is being taken by others. The list of impacts to people might be added to, such as impacts from reservoirs could result in longer transportation/commutes by people to areas on the other side of the reservoir, increased malaria due to standing water (implicit in the health issues from standing water), lost infrastructure – roads, bridges, homes, from inundation of reservoirs. Upstream might also have higher schistosomiasis due to a loss of predators of snails that carry it resulting from dams as migratory barriers – if it is an issue in the basin.<br><br>Agreed that more guidance is needed to improve the existing EIA procedures from 2015, and what is presented is a great start. The AOI is an excellent approach which can be used in assessing potential dams and impacts to determine siting and avoid areas that would result in high social impacts, and I recommend that change in the description and introductory paragraph, since once a dam site is defined, there is no avoiding those social issues. This suggests a system-scale analysis for dam development. | |
| 74-76 | The Ayeyarwady Basin Sustainability plan puts forth a reasonable and logical narrative for minimizing impacts from hydropower development, including retaining free flowing reaches to headwaters (Ayeyarwady mainstem & Chindwin River), avoiding KBAs and protected areas, and concentrating development along priority cascades. As noted above, additional detail on how the sub-basins were prioritized (and/or quantitative metrics describing the impacts on individual natural/social resources) would increase transparency and strengthen the case for this narrative. | See above. The SEA Final Report will also show how the baseline chapters and sub-basin evaluation reports informed the analysis. |
| 79-82 | It will better to ensure that public consultations must be comprehensive enough and reach out to all stakeholders with various media. There must be a platform of getting individual voices if possible. Please not that some CSO and EAO are not truly representing the entire communities' voices. The failure of "Myitsone" is based on the fact that there was little or no public consultation.<br><br>Benefit sharng mechanism needs to be well informed to ongoing national reconsliation and preace processes as well as responsibilites of stakeholders must come alog with rights. | Agree, the SEA final report calls for improved stakeholder consultation in relation to hydropower planning. Further analysis is needed on benefit sharing mechanisms which is recommended in the final report.<br><br>Agree, will include that conflict also occurs among EAOs in some areas. |

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| | Conflicts are happening not oly between MyanmarArmy/border forces and EAOs but also happening among EAOs in the same terriorties. | |
| 87 | Sustainable Development Implementation Plan – Should start with an assessment of demonstrated needs for energy and water services, including ancillary services such as support of non-hydropower renewables | The SEA starts by defining the underlying E&S values of sub-basins in Myanmar to inform planning. Future integrated energy assessments / resource planning are needed to include an assessment of non-hydropower renewables, however this was beyond scope of the SEA. Raising environmental and social sustainability issues into the hydropower planning process had not previously taken place and that is what the SEA aims to do. |
| 87 | Under 10.1. Joint Implementation Committee: include one more essential function: Oversee system-scale planning efforts at basin-level as a basis for selection of projects | Noted. |
| 87 | Under 10.2. Sustainable hydropower policy: commitment to sustainable hydropower AND improved river basin planning | Revised. |
| 87 | Under 10.2. Sustainble Hydropower Policy: incorporation of environmental and social considerations, not only into project design, but into the basin level planning at the earliest stages of development | Agree, this has been re-written as incorporating E&S into planning is the concept of basin zoning plan. |
| 88 | Under 10.3. Basin Zoning Implementation: after 10.3.1. insert an additional step, before the step “Screening Against Basins Zoning Plans”, that considers carrying out Basin Plans for each of the Basin Zones in the country. Any project, whether it is sited in a low, medium or high impact zone, would generate impacts. Basin-scale planning in each Basin Zone identified would look at a basin wholistically and assess the less impactful portfolio of projects against any project could be proposed. | Disagree. The SDF essentially fulfils the first edition of a basin-wide hydropower planning. Hydropower project planning is at many different stages and will not wait until every basin has a plan. The basin zoning can inform the River Basin Master Plan for the Ayeyarwady which is already underway along with future studies. The screening against zoning plans fills a critical short-term gap to ensure projects are assessed based on the underlying values of sub-basins and basins. |
| 88 | Under 10.3.2. Screening Against Basins Zoning Plans: in line with our previous comment, a Clearance Certificate for a submitted project could only be issued if it is considered as part of a portfolio that stems from the Basin-scale Plan. | Disagree. It is part of basin-wide planning by being screened against the sub-basin zoning plan and mainstem reservation to maintain basin-wide processes. |
| 88 | Under 10.3.3. Project Screening Criteria for High Zone Sub-Basins: similar to our previous comment, a Clearance Certificate for a submitted project could only be | Disagree. But such smaller scale, lower impact projects are recommended to only be given clearance if they meet yet-to-be developed proposed criteria |

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| | issued if it is considered as part of a portfolio that stems from the Basin-scale Plan. | that ensures the level of impact of that and any other already approved projects not exceed acceptable threshold levels. |
| 89 | Under 10.3.3. Project Screening Criteria for High Zone Sub-Basins: in line wit our previous comments each project should be considered against a basin-scale plan, which among other things would need to include an analysis of cumulative impact thresholds. We propose then dropping the paragraph "Each proposed project…" | Basin scale plans are still being developed and are a key recommendation to develop these in other Basins e.g. the AIRBM is starting a river basin master plan for Ayeyarwady (2018–20). |
| 89 | The Sustainable Design Guidelines as laid out in are thoughtful and important to include as individual project development proceeds. One element that was lacking was a reference to the community of practice surround sustainable hydropower design. Specifically, the IHA's Hydropower Sustainability Assessment Protocol ( http://www.hydrosustainability.org/) is a tool that forms a de facto international standard for assessing sustainability across multiple dimensions. While other assessments could capture much of the same information, referencing or recommending use of HSAP can help ensure designs are up to international sustianability standards. | Noted. |
| 91 | Under 10.5.2. Hydropower Cumulative Impact Assessment Procedure: even though the aim of a cumulative impact assessment, as well as of a strategic environmental assessment, is to assess a whole system upon specific project might be implemented, this section revolves around a pre-determined, pre-sited single project. Hence, the way is framed here any strategic and basin-wide issues are assessed vis-à-vis and subject to a predetermined project, and not the other way around. As indicated before in order for a project to be eligible is would need to be part of a portfolio of projects stemming from an CIA. | Noted, terms of reference (TOR) for any future CIAs would consider the specific nature of the sub-basin and likely developments. |
| 91-92 | Under 10.5.3 through 10.5.6.: all these issues would need to be addressed a variables when conducting basin-scale planning exercises for each of the Basin Zones identified. By doing so, it would ensure that those impacts and risk potential would be minimized as possible, and allow for more wholistic approach to overcoming challenges posed by social conflict, resettlement, benefit-sharing and watershed protection actions. | Agree. |

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| 92-96 | In addition to the mainstem and medium and low valued watersheds, having some high valued watersheds might be good opportunities to learn about river dynamics and ecology as well. The medium and poor values do indeed offer a control/impact design since some for these will remain undammed, and some will become dammed, so that part is an excellent suggestion.<br><br>Flow gage stations and climate stations are relatively inexpensive since the cost is mostly initial equipment costs, and data can be sent remotely to satellite or downloaded at intervals. Maintenance is always necessary, but the costs are different than field surveys. This is indeed a greatly needed effort. Maintaining processes – here, flow, which is termed by many as the master variable, would perhaps be the most immediate need for data collection.<br><br>Sediment transport is also needed given the sediment dynamics of these rivers. Once flow/sediment curves are established along with the relationships of sediment and turbidity measures for suspended sediments, turbidity monitoring equipment can be installed with flow gages to monitor sediment transport. Bedload would need continued monitoring at appropriate times.<br><br>Fisheries and biodiversity are indeed critical information needs here. The local surveys being conducted are probably consulting with fisherman about the types of fish they catch during different seasons – a critical initial source of information. The KBA expansion according to catchment boundaries is a good approach, but not sure if that is a priority here, unless KBAs are a criterion for avoidance of dam site selection. Information on fishes such as Hilsa might be gathered by knowledge and ecology information available within the region, such as the Hilsa in the Ganges drainage, to suggest general distributional patterns of similar fishes. In addition, defining water falls that act as barriers might be helpful spatial data to define breaks in distribution of certain groups of fishes.<br><br>The statement: “Socio-economic conditions and livelihood studies are better conducted at a project or cascade level. However, understanding vulnerability (e.g. flood and drought) and dependence on natural resources at the sub-basin | Thanks for the suggestions, agree that compiling basin wide information is a long-term process.<br><br>Flow gauging is critical on mainstem rivers, but this is usually linked to a sediment assessment (bedload, coarse and suspended sediment measurements conducted at the flow gauging site).<br><br>Aware of limitations around social and livelihoods data, that is why these sub-basin ratings were not included in the sub-basin zoning. |

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| | or basin level could help inform basin-wide planning" is excellent, and gets to the point made in the section on social and livelihoods issues.<br><br>Given the lack of information available at this time and time frame, the approach is limited but reasonable. | |
| 99 | Under 10.7.2. Data Collection and Research: it is not clear how the integrated assessments for sub-basins would inform the hydropower related assessments, given that timing does not fully align. Further elaboration would be required. | Agree, however not everything can be done at once and the SEA prioritizes understanding the basin-wide processes first. |
| N/A | Overall, the document is well structured and well written, and follows a logical progression of thought and presentation. | |
| N/A | Recommendations regarding conducting a cumulative impact assessment (CIA) require further thought. The proposed CIA that would involve assessing the cumulative impacts of multiple hydropower schemes as a cascade within a given basin or sub-basin, is not really a CIA as defined in the IFC CIA guidelines. Rather than assess the cumulative effects of a given project in concert with other reasonably foreseeable activities, projects or programs, including those associated with other extraction industries such as mining, forestry, etc., what is being proposed is actually a Regional Impact Assessment (RIA) or Regional Strategic Environmental Assessment (RSEA) of aggregated hydropower schemes. The writers should be mindful of this distinction. | Noted, TORs for any future CIAs would consider the specific nature of the sub-basin and likely developments. |
| | Where the Mekong River forms the border between countries, how was the percentage Basin Area derived? Perhaps explain in a footnote. | It is the area of Mekong catchment lying in Myanmar territory, as a % of the total area of the Mekong basin. |
| | 1st sentence below italicised quotation – there is some confusion over the definition mid-sized hydro; here it is identified as "10< MW to ≥30 MW, whereas previously it was identified as "10 MW to 100 MW"; perhaps the distinction needs to be made between what Myanmar considered mid-size and what IFC/WBG consider mid-size | This is the Law definition in Myanmar, which has been made clearer with an edit. The standard used for Medium is indeed 10-100 MW as stated in Sect 2.3. |
| | s.8.1, (ii) Cumulative Impact Assessment – see 2nd comment at the beginning of this comments matrix. | |

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| | Also, CIA should be prepared for hydropower projects regardless of whether additional cascade development is proposed, based on other reasonably foreseeable activities, programs or projects (hydropower or other) | Yes, project level CIAs if no basin level CIAs are conducted. If a basin-wide CIA has been conducted then projects do not need a separate CIA if the timing aligns. |
| | In Chapter 2 SEA Purpose, Vision, and Principles, section 2.2 SEA Vision and Objectives, one of the vision as stated below "share development benefits with affected people, communities, and regions", in the later chapter of the report, it is suggested that to suspend pending large scale engineering projects, thus it will affect local tax and employment, worsen unemployment and hard to take measurement. | The foregoing of some proposed HPPs would mean that local taxes and increased employment is foregone, but this does not "worsen" unemployment.<br>As millions of people rely upon the natural resources that would be affected / degraded by BAU hydro development this loss of livelihoods should be taken into account.<br>The SEA promotes a balance – it rightfully does not advocate all BAU projects for the tax revenue potential and employment benefits that are mostly during construction. |
| | In Chapter 2 SEA Purpose, Vision, and Principles, section 2.2 SEA Vision and Objectives, one of the vision as stated below "generate adequate, reliable and affordable hydropower energy for domestic consumption and export", in the report the total installed capacity of hydropower and other clean energy has been decreased from 42,968MW to 994MW, the economic benefit of electricity generated by hydropower as export commodity has been severely disrupted. | Incorrect. The recommended change in **potential** hydropower capacity is from 43,000 MW to 8,900 MW+ as outlined in Section 8.4, while total hydropower is expected to be 12,200 MW+.<br>Unsure where the figure of 994 MW comes from.<br>The SEA makes no estimate or recommendations on other forms of clean energy. |
| | In Chapter 7 Hydropower Business-as-Usual Development Impacts, only negative impacts and no positive impacts have been mentioned. | The objective of the SEA was to assess the E&S impacts of BAU hydropower to be able to develop the SDF. The SEA is providing a missing piece in the conventional planning of hydropower. |
| | In Chapter 8 Sustainable Development Framework, section 8.5 Social and Livelihood Issues, section 8.6 Conflict, no considerations have been taken with regard to lack of electricity and electricity shortage in most of Myanmar due to the suspension of hydropower plant, it brings negative influences on social development and livelihood, and triggers regional conflicts. | Disagree. The lack of electricity in these areas is not due to the suspension of **proposed** projects, but due to many factors.<br>Large projects can be a source of both conflict and conflict resolution. Please refer to the SEA Baseline Chapter on Peace and Conflict: https://www.ifc.org/wps/wcm/connect/e0d299b0-a141-44c5-84e3-7286f14bc28f/Chapter+8_SEA_Baseline+Assessment_Peace+and+Conflict+SEA+Baseline+Assessment.pdf?MOD=AJPERES |

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| | In Chapter 10 Sustainable Development Framework Implementation Plan, section 10.2 Sustainable Hydropower Policy, it is suggested to incorporate the SEA vision with one additional principle, that is, local community's participation/involvement. It calls for public hearings in relation to SEA report with local people, organizations, and hydropower developers. | The objectives set major outcomes that are desired, whereas community participation is seen as an important component of the process. It is agreed that this is critical, as recommended in Sections 8.6.3 and 10.5.1. |
| General comments | Planning for Myanmar's sustainable economic development is at a pivotol stage with a significant range of issues and opportunities to be considered. An update to the Nationla Energy Masterplan is being prepared, and this SEA of the Hydropower Sector will contribute to it. SEAs are an important pillar of master planning, but not the only one. Harnessing Myanmar's extensive resource development opportunities in a sustainable manner for current and future generations will require a balanced approach that preserves opportunities.<br><br>The SAE study is a positive first step in basin-wide hydropower planning, assessing more than 50 riverine sub-basins in Myanmar. However, a fundamental concern is that it assumes mainstream sites must not be developed. A more balanced approach, even exclusively from the environmental perspective, is that hydropower sites should be subject to the same criteria of assessment, whether they are on the mainstream or not. The study, by excluding mainstream sites 'a priori', could lead to less sustainable outcomes.<br><br>The study consequently excludes a much bigger proportion of national potential than has been done in almost all developed economies.<br><br>Worldwide, there are mainstream hydropower facilities that have delivered major developmental benefits for generations. Future options assessment should look at the cost-benefit balance of such sites in the same way as any other part of the river system. Although not mentioned in the study, tools are now | Agree that sustainable development is the key, achieved through balance, which is the vison for the hydropower sector.<br><br>Sustainable hydropower cannot be developed without accounting for the resulting environmental and social impacts. The SDF is recommending that mainstems of Ayeyarwady, Thanlwin, Chindwin, Mekong and Sittuang Rivers are reserved as large projects on these major rivers will result in impacts on basin processes and ecosystem services that cannot be overcome (i.e. loss of system connectivity, sediment transport, fish migration and alteration of seasonal flows).<br>Interestingly, the Chinese Government has also suspended the 13 dams proposed in the Nu Jiang (Upper Thanlwin) due to concerns around the E&S impacts.<br>The SDF promotes sustainable development, which is estimated to result in excess of 8,900 MW of additional new generation as outlined in Section 8.4, and total national hydropower in excess of 12,200 MW. |

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| | available to ensure that hydropower development is assessed on a sustainability basis.<br><br>Two supporting examples:<br><br>1) Spanish part of the Duero basin, where 91% of the energy is from nine mainstream projects. This report (Huertas Gonzalez, 2014) questions the value/sustainability and cumulative impact of the additional projects in the sub-basins.<br><br>2) Tapajós Basin, Brazil: The Nature Conservancy (Hydropower by Design, 2015) preferred options including mainstream sites for future development of the basin. This involved three mainstream dams, and preserved an additional 2000km of river connectivity in the sub-basins.<br><br>In summay:<br>1. The study places greater emphasis on the challenges of developing hydropower without sufficient recognition of the significant multipurpose benefits it can deliver, including the support for other, more variable forms of renewable energy.<br>2. Myanmar has the potential to become a low carbon, renewables-driven economy. By automatically excluding the majority of the hydropower potential, this SEA threatens that opportunity, and suggests pathways that most countries have already committed to move away from.<br><br>The proposal to avoid mainstream hydropower development 'a priori' should be reconsidered. | |
| 4 (or pg 17 in pdf) | **"The SEA vision for hydropower development in Myanmar is: Sustainable hydropower development based on integrated water, land, and ecosystem planning,balancing a range of natural-resource uses and priorities to achieve economic development, environmental sustainability, and social equity."** | Agree, this should be conducted in future studies, but this was not the scope of the SEA. |

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| | Comment: For a comprehensive assessment of sustainable hydropower development, it is essential to include intergrated energy systems planning. One cannot look at hydropower (or any energy source) in isolation. The various trade-offs between hydropower and other potential forms of power generation need to be looked at holistically and at the system level. | |
| | **Visions and Objectives**<br>The objectives use very restrictive language before the assessment has even occurred. It doesn't necessarily allow for an objective assessment. | Disagree. A positive vision of achieving the balance between generation and maintaining basin health was set. The TOR was discussed at the Water, Food, Energy Nexus Forum in Phnom Penh in 2015, in the kick-off meeting in October 2016 and builds on the outcomes of the sustainability conference that the World Bank Group held with IHA in Jan 2015. |
| | **Visions and Objectives**<br>There is no mention at all of the direct and indirect water services that can be provided by hydropower infrastructure. This SEA may restrict hydropower equipment being installed at multipurpose infrastructure (where it is the land-use change that causes the majority of the impacts, not the hydropower services).<br><br>Water services such as flood and drought management, irrigation, municipal water supply and navigation. Water stored in reservoirs can mitigate impacts due to climate variability in hydrology. | The SEA does not restrict the installation of turbines at existing irrigation or water supply reservoirs. |
| 6 | **"While some projects with less than 10 MW capacity may have a greater environmental or social impact than larger projects, small projects were excluded to focus on the most significant cumulative basin impacts."**<br><br>The cumulative impact of multiple small hydropower projects may be disproportionately larger in comparision with the impact of a single larger project. Small projects often avoid many of the regulations and oversight that are applied at larger projects . | Agree that small hydropower projects can still have significant impacts at a site at the watershed level. However, the scope of the SEA as communicated throughout all phases project was to assess the impacts of medium-large hydropower projects at a basin and sub-basin level.<br><br>Further studies are recommended to include assessment of small and micro hydropower projects. |

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| | Integrated system planning should take these factors into account. There is a strong need to better understand the ratio of impact to energy throughout this assessment.<br><br>The Nature Conservancy and others have shown that small-hydropower projects built with inadequate river basin planning have potentially greater impacts than a single large project (which often offers multiple services). Smaller projects tend to provide a single service: power production.<br><br>On page 3: "Myanmar has the unique opportunity to develop hydropower in an integrated and sustainable manner before significant impacts occur to river systems.".<br><br>If that statement is to be true, small hydropower projects should not be excluded from the analysis. | |
| 7 | **"Retention of intact rivers/sub-basins: It is critical to retain intact rivers/sub-basins so that they continue to provide their full natural functions and values to offset the degradation of other rivers/subbasins from hydropower development. <u>Reservation of an entire unregulated sub-basin, where larger scale hydropower is excluded</u>, helps maintain seasonal flows, water quality, geomorphology, and aquatic habitat, thereby contributing to the overall health of basin processes."**<br><br>It depends what is meant here by 'larger scale' and whether the definition encompasses the cumulative impacts of smaller schemes. Several small (under 10MW installed capacity) schemes could have a more significant impact than one larger project. Without regard to the cumulative aspects of smaller scale generation, this paragraph seems to be giving licence to unbridled development of smaller schemes even within retained sub-basins. Again we advocate a whole basin approach where development is planned with the entire eco-system services the river offers in mind. | The SDF Zoning Plan can still be applied to projects of less than 10MW installed capacity. |

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| 20 | **"In 2014, energy exports accounted for around 34%, or 6.3 metric ton of oil (Mtoe) equivalent, of total domestic energy production (18.5 Mtoe). Exports have now increased to 11.7 Mtoe, or around 44% of domestic energy production, according to the International Energy Agency's statistics."**<br>Mtoe = million tonnes of oil equivalent (not 'metric' tonnes)<br>Not clear if total energy exports include hydropower or not. If so, what conversion factor is being used to convert back to primary energy (assuming energy export is in primary energy and not electricity). | Revised. |
| 20 | **"But in the short to medium term until 2030, further domestic fossil-fuel development or significant utility-scale renewables are unlikely to feature in power-development plans."**<br>Hydropower is a significant utility-scale renewable energy resource. | Revised. |
| 20 | **"its relative importance in the energy mix"**<br>"importance" is a value statement. Use "contribution" instead. | Change to contribution. |
| 21 | **"Both gas and coal have the advantage of having plant construction close to load sources, but both are substantial emitters of greenhouse gases and are likely to be more expensive than hydropower."**<br>Please also include local air pollution impacts (especially for coal fired generation – PM2.5/10, $SO_X$ and $NO_X$). Communities within the load centres being exposed to this pollution will be sorely affected and cost to benefit SEA's should take this into account too. | Agree, the NEMP includes greenhouse gas emissions (GHGs) to assess the environmental impacts of gas, coal, diesel, hydropower and other energy sources. Further assessment of the cost-benefit and E&S risks of all energy sources in the NEMP (2018) are needed. |
| 20 | **"At the same time, Myanmar is increasing its energy imports, particularly oil products, because of limited domestic oil supply and refining capacity. This will lead to a growing reliance on fossil-fuel imports for power generation."**<br>This situation could be an outcome, especially if the majority of Myanmar's hydropower is deemed to be off limits, as proposed in the SEA. | Disagree. The **estimated** outcome of following the SDF is the addition of in excess of 8,900 MW new capacity, with the total sector reaching in excess of 12,200 MW. By comparison, the Draft NEMP (presented in February 2018) includes an estimated 13,192 MW of hydropower in the energy mix by 2030. |

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| 21 | **"Although this could make power supply more expensive, such a diversification <u>might</u> increase energy security if stable supply chains were secured."**<br>**"Similarly, gas-fired plants would be dependent on imported gas in the medium term, most likely using LPG imported from the Gulf states."**<br><br>Myanmar has the potential to become a low carbon, renewables-driven economy. This SEA threatens the opportunity, and suggests pathways that most countries are committed to move away from.<br>I | The SEA promotes sustainable hydropower generation, not hydropower development at any cost. |
| 22 | **"dominated by the private sector.."**<br>The numbers don't agree. 7 projects are privately owned, with 22 owned by MOEE/MOALI, and only two of 6 under construction are private sector projects. | This statement refers to 'planned projects'. |
| 22 | Hydropower capacity at the top of the page is cited as 3398+33.3 = 3431 MW. Later on it's 3255 MW. Description of the break down between publicly owned and private ownership/JVs would be better suited in the earlier section about private ownership. | Revised. |
| 23 | **"Available capacity is about 50% of installed capacity due to poor maintenance"**<br><br>Available capacity of what? Hydropower or total power generation installed capacity? | Total power generation. |
| 23 | **"This generation mix aims to reduce the country's reliance on hydropower, thereby improving supply reliability during the summer months"**<br>Hydropower provides the majority of electricity in more than fifty countries, many with the most reliable and lowest cost of supply. If the system is planned | Adequate storage projects would help to provide adequate power in the dry season. The sentence is referring to current planning outside the SEA - the SEA is not providing this comment as an opinion. |

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| | with the adequate storage capacity and well managed through integration with other low-carbon sourses, Myanmar's future could be a bright, clean one. | |
| 26 | Numbers is text (43,849 MW), doesn't no match Table 5-2 (42,854 MW) | Revised. |
| 26 | **"Over 60% of all proposed projects by capacity are on the Thanlwin mainstem (34%) and in the N'mai Hka sub-basin (26%)."**<br><br>Table 5-1 shows 24,604 MW proposed/identified on the Ayeyarwady basin, which is 56% of total projects proposed/identified. How can 60% of projects be on the Thanlwin mainstem?<br><br>Unless the report is trying to communicate that 60% of the 16,110 MW proposed/identified projects in the Thanlwin basin are located on the Thanlwin mainstem (9,666 MW). | The report is indicating that 34% of proposed projects are sited on the Thanlwin mainstem and 26% in the Nmae Hka, and together this totals 60% of nationally proposed capacity in these combined locations. |
| 27 | What is the difference between Table 5-2 and Tables 5-3? Why not combine the two? Both are list proposed hydropower projects by installed capacity (although one just says "capacity"). | As defined in Terminology. Table 5.2 is 'planned' projects, Table 5.3 are 'potential identified sites'. The second group have only been identified at regional level, are smaller on average (generally between 10-30 MW) and generally at the concept stage., whereas the average proposed project is more advanced. |
| 27 | General on Section 5.7: The section is not consistent with itself. It would be helpful if the proposed projects and their statuses could be listed individually or graphically mapped. Numbers are often contradicting themselves and difficult to follow. | All numbers are correct.<br>All proposed and identified projects are listed in Appendix D. The projects are mapped in Figure 5-1. |
| 29 | **"Therefore, CSOs in the Upper Ayeyarwady, Thanlwin, Tanintharyi, and Sittaung basins all expressed concerns around conflict, control of natural resources, and the rights of ethnic minority groups."** | Yes, the CSOs are concerned about the poor governance related to the implementation of existing hydropower projects. |

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| | Is this more an indictment of governance rather than the sustainability of a hydropower project? | |
| 29 | **"Benefits"**<br><br>No flood/drought management services listed as benefits?<br>In addition, avoidance of pollutants / emissions, improved navigation, and grid benefits (ancillary services). Furthermore "opportunity for irrigation" drives increased agricultural productivity benefiting "food security" which is listed as an impact. | These are the impacts and benefits listed by stakeholders that we consulted throughout the SEA process, not a general list of hydropower impacts and benefits. |
| 29 | Section 6.2: More information on the data gathering process and statistics would be welcome: how many people surveyed, their locations, etc. | Please refer to the Regional River Basin Report: https://www.ifc.org/wps/wcm/connect/b04f2ce1-632b-4351-af32-b79b86a0c6c0/Final_Regional+River+Basin+Consultation.pdf?MOD=AJPERES |
| 30 | Example of the Tanintharyi basin seems to apply to a gas project. | In the first round of consultations the stakeholders were asked to identify risks and opportunities related to river basin development in Myanmar. The Tanintharyi examples applies to both gas (given their direct experience) and planned hydropower. |
| 30 | **"Stakeholders in the Sittaung basin, the most intensively developed basin for hydropower to date"**<br><br>Table 5-1 and earlier text contradict this statement. The Ayeyarwady has almost three times operational hydropower capacity than Sittaung.<br><br>Unless you are using a different definition of "developed basin". If so, please define it. | The following clarification of "intensively" has been added:<br>…(based on installed capacity per $km^2$ of basin) |
| 30 | Mining raised as a significant issue: It would be important to note whether these mines are linked to hydropower development. | Yes, the stakeholders were asked to define issues and opportunities of river basin level. A basin wide assessment needs to understand the pressures from other sectors on natural resources. Mining has potential to impact water |

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| | If not, should this be included in the SEA? | quality in hydropower and irrigation reservoirs and is a driver of forest loss which can impact sedimentation. |
| 33 | Section 7, General: It would be very helpful to have a map of each basin showing where (and the size) of each project that's been proposed and identified within the BAU scenario.<br><br>What is the difference between a "proposed" project and an "identified" project? In this case, the BAU analysis treats them essentially the same, so why bother making a difference?<br><br>A lot of qualitative value statements are used when describing threats, impacts or vulnerabilities. These have little or no context, e.g. it's not clear what constitutes "high" vulnerability as opposed to "middle" or "low". A scoring statement which would outline the differences in each high,middle and low category would help put these impacts and vulnerabilities into relative perspective. | The maps of Myanmar basin and sub-basins are included in the Annex.<br>The 'identified projects' only have the approximate location, name and capacity (MW), whereas the planned projects have much more technical information. Please see HPP database: https://www.ifc.org/wps/wcm/connect/07b1eba5-9c63-4f7c-8674-d463732a0395/Copy+of+18+02+07+MYA+SEA+HP+Database+WB-IFC.xlsx?MOD=AJPERES It is an important distinction as these projects are likely to have been planned at the State/Region Level, for example, States/Region can develop projects between 10–30MW under the Electricity Law (2014).<br><br>A summary of the scoring will be included as an appendix in the final SEA. |
| 33 | BAU development shows 28,000 MW for Ayeyarwady and 21,000 MW for Thanlwin. Table 5-1 has different numbers. I thought the BAU assumes that all the 69 proposed and identified projects would be developed. These numbers are not consistent. | Figures are correct. The totals given are for the eventual MW, including existing and under construction. |
| 33 | **"BAU development would involve medium-to-large-scale storage and run-of-river HPPs located on most medium to large rivers across Myanmar, including…"**<br><br>BAU development would involve medium-to-large scale hydropower because the study explicitly excludes the inclusion of small hydropower. | The point being made relates to the extent of development i.e. most medium and large rivers would be developed under BAU. Whereas the SDF is promoting the retention of some of these as intact rivers. |
| 34 | It appears that the BAU analysis does not take into account current sediment management practices. | As no projects to date include sediment flushing beyond low level gates is assumed that BAU development would not involve substantial sediment flushing facilities. |

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| | A variety of options can be built into greenfield projects to better manage sediment. See: https://www.hydropower.org/sediment-management | |
| 36 | **"effectively 100%"** .. there's an analysis that came up with a number that wasn't 100%. | Revised. |
| 38 | Are there explicit concerns about transboundary effects for aquatic biodiversity?<br>The fact that the NamHkoke is transboundary should probably go in another secion orther than aquatic biodiversity. | In this case the Nam Hkoke is a transboundary river with the presence of migratory fish species. |
| 45 | Why exclude irrigation dams? They have dam walls that can disconnect aquatic habitat too. For a full basin-study, irrigation dams (and other non-power dam infrastructure) should also be included. | Irrigation dams were included in the study. The extent of dam reservoirs (including irrigation) was determined using the Global Surface Water database and used in the sub-basin rating for Aquatic Ecology and Fisheries. Also from consultation with the Ministry of Agriculture, Livestock and Irrigation (MOALI) it appears that there are no plans for additional irrigation dams given the recent upscaling in the Central Dry Zone (CDZ) and Sittaung Basin. ADB, JICA and other donors are also rehabilitating existing multi-purpose projects. |
| 46 | "**Site screening against the SDF Basin Zoning Plans for all projects larger than or equal to 10 MW capacity;"**<br>A lot of literature exists that cautions against the cumulative impacts of small hydropower developments, especially those that do not undergo wider basin-level system planning. As stated earlier, the only opportunity to avoid significant cumulative impacts on the basin is to employ basin level planning during project selection, siting and design. Furthermore, drawing a 10 MW line would insinuate that a 10 MW project has significantly more impact than a project with 9.9 MW. Why impose a limit on the electromechanical equipment when it's typically the dam infrastructure that has the impact? | All projects over 1 MW are subject to impact assessment (EIA or IEE), therefore their impacts will be assessed.<br>The SEA purposefully targeted projects 10 MW and above as indicative of impacts. Some projects of 9 MW capacity could have a greater impact than a 100 MW project for example, but this is the exception and not the rule.<br>It's worth noting that Norway adopted 10 MW as a cut-off, and that Myanmar and many other countries recognise that smaller capacity projects require a less detailed impact assessment. |
| 46-47 | **"Projects proposed on reserved mainstem reaches should not be permitted to apply for an MoU. Large-scale projects proposed in high-value sub-basins should also not be granted an MoU, while it is proposed to identify** | The SDF is recommending the mainstem Ayeyarwady, Thanlwin, Chindwin, Mekong and Sittuang Rivers are reserved. Projects on these mainstems would have major impacts on connectivity, sediment transport, fish |

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| | **opportunities to meet the needs of rural and remote communities by screening smaller scale, lower impact projects in these drainage areas against additional criteria to determine if they should proceed."**<br><br>Projects should not be excluded ex-ante. River basin planning and impact assessments should weigh the impacts of projects on mainstem with projects in sub-basin or tributaries. There are possibilities that the cumulative impacts of projects on tributaries have higher cumulative impacts than a single project on the mainstem. A mainstem multipurpose project may offer more benefits than smaller projects dedicated only to power generation. | migration, and may also significantly alter seasonal flows unless possibly if they were designed as run-of-river with low height dams. |
| 51 | **"Mainstem reservation implies excluding all hydropower projects on these river reaches"**<br><br>We see this as potentially detremental to Myanmar's future sustainable development. | See above. |
| 59 | • **"project location – should exclude the main sub-basin river (except in the headwaters of that sub-basin where this river is small) or on any watershed over a specified maximum area in subbasins that discharge via a single river;**<br>• **maximum degree of sub-basin flow regulation – taken as a cumulative of all HPPs above in the sub-basin;**<br>• **maximum project size – for example, dam height above river-bed level, reservoir volume, or MW capacity;**<br>• **a preference for run-of-river projects over storage projects; and**<br>• **avoidance of direct or indirect impacts on notable sites, for example, a protected area…."**<br><br>By the ex-ante preclusion of certain types and sizes of hydropower projects, the possible development of sustainable hydropower with respect to the energy and water services it can provided is severely restricted. For example, multipurpose | These are four projects planned in high zone sub-basins, the natural processes and connectivity with mainstem is recommended to be maintained. |

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| | storage projects which can meet the needs of the community or region in question.<br><br>Hydropower is site-specific and projects should be assessed based on site-specific criteria under the the river-basin and energy system planning frameworks. Maximum project sizes should be used as guidelines, but not as hard-rules.<br><br>Run-of-river projects are only able to offer limited multipurpose water and energy services. Storage hydropower provides energy balancing services, enabling variable renewables and reducing the dependence on natural-gas peaking or load-following projects. Run-of-river projects also are unable to offer the flood control (or drought management) services that can have significant impact on local people, agriculture and business. Run-of-river projects are more susceptible to varying flows and climate mitigation. Run-of-river projects may have less impacts, but also noticeably less wider system benefits. Planning needs to look at effectively balancing both impacts and benefits to maximise system benefits and reduce impacts. By a priori excluding certain options, this restricts this analysis. | |
| 59 | **"Another criterion that should be considered is banning extensive new road construction or major road upgrading for project access in high conservation-value terrestrial habitat (Protected Areas, KBAs, critical habitat, and intact forest), given the indirect impacts that could have on these areas."**<br><br>Shouldn't this be on a case-by-case basis with consultation with project affected communitites? | All smaller scale lower impact projects proposed in High zone sub-basins would be screened on a case-by-case basis.<br>In some cases, the desire of a local community for a road may be outweighed by the potential for damage to a high conservation value area from such activities as illegal logging. |
| 60 | • **"Low-zone sub-basins with existing (operational and under construction) cascade hydropower development;**<br>• **Medium-zone sub-basins with existing cascade hydropower development;** | The presence of existing infrastructure (water supply, irrigation) has been factored into the sub-basin rating for aquatic ecology and fisheries. See Baseline Chapter on Aquatic Ecology and Fisheries: https://www.ifc.org/wps/wcm/connect/c01ac2f3-0b6d-4f94-b281- |

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| | • **Low-zone sub-basins without any existing medium/large HPPs; and**<br>• **Medium-zone sub-basins without any existing medium/large HPPs."**<br><br>Sholuld consider those also with existing water infrastructure, i.e. irrigation dams, under the same reasoning. Powering of existing infrastructure is also an option with relatively minimal impact. (this applies also to cascade development) | db9488bc8a91/Chapter+5_SEA_Baseline+Assessment_+Fisheries+and+Aquatic+-+21+Sep.pdf?MOD=AJPERES |
| 64 | The reservations would curtail the development of projects totalling 22,160 MW on the mainstem and a further 13,895 MW on sub-basins. This totals some 36 GW of power generating installed capacity which will have to be replaced by some other alternatives.<br>It would be prudent to couple this with long-term power system models that are consistent with long-term energy goals (electrification and general decarbonisaton), that are also consistent with climate pledges and the SDGs. The replacement of 36 GW by fossil fuel would be a regrettable outcome with long-lasting local and global consequences. | Proposed projects are just proposed, not a fait accompli. They have been proposed as individual projects, not as a group to meet a set target, so this many GW of generation may not be required, and therefore this full capacity does not have to be "replaced". Going forward other forms of energy may prove more cost effective than at least some of these proposed hydropower capacity, most likely including other renewables.<br>The related objective in the SEA is to produce adequate affordable and reliable power.<br>Long-term power system modelling is essential, but it does not drive the SEA which is based on achieving a balance. |
| 67 | **"It can also be assumed that sub-basins with high and very high ratings for aquatic ecology/fisheries and geomorphology provide relatively**<br>**healthy ecosystems services that are utilized."**<br><br>One could also assume that these sub-basins have experienced little anthropogenic influence, as increased human settlements on and around river basins will have negative impacts on ecology and geomorphology even without the presence of hydropower infrastructure. | That is true. The harvesting of aquatic natural resources may be at a very low level due to low population intensity. |
| 68 | Figure 8-3. The inclusion of transmission lines in the area of influence should also be applied to other grid connected power generation technologies. | Agree. |
| 69 | **"hydropower has been shown to have widened gender disparities through the disproportionate share of impacts on women"** | Christina Hill, Phan Thi Ngoc Thuy, Jacqueline Storey & Silavanh Vongphosy (2017) Lessons learnt from gender impact assessments of hydropower |

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| | Source please? | projects in Laos and Vietnam, Gender & Development, 25:3, 455-470, DOI: 10.1080/13552074.2017.1379777. |
| 70 | **"Conflict can also be understood as local or national public opposition to specific projects"**<br><br>Conflating conflict between state and non-state armed groups with local opposition to hydropower projects is not fair.<br><br>Any kind of government backed development can worsen conflict when conflict is between state and non-state interests. | Please refer to specific cases cited in the Baseline Assessment Chapter-Conflict in Myanmar where hydropower has been linked to conflict: https://www.ifc.org/wps/wcm/connect/e0d299b0-a141-44c5-84e3-7286f14bc28f/Chapter+8_SEA_Baseline+Assessment_Peace+and+Conflict+SEA+Baseline+Assessment.pdf?MOD=AJPERES<br><br>Agree, and have included 'and other developments'. |
| 87 | Sustainable Hydropower Policy should be coupled with national energy system planning. | Agree, future studies are needed for integrating energy systems, but this was beyond the scope of the SEA. |
| 89 | **"10.4.1 Sustainable Design Guidelines - Following project siting, the design of a hydropower project is the next most important opportunity to avoid and minimise major environmental and social impacts. Key design options that should be considered in project design include:**<br>• **Environmental-flows (EFlows) release**<br>• **Hydropower generation off the EFlows release**<br>• **Variable height intake**<br>• **Reservoir mixing at the intake**<br>• **Re-regulation weir**<br>• **Fish passage**<br>• **Sediment flushing**<br>• **Multi-project coordinated releases"**<br><br>Following project siting, to merely consider the above-mentioned technical aspects of the HPP design seems to be a narrowed scope approach, which can leave behind many opportunities and risks. A more holistic approach should be taken to identify both risk and opportunities to "avoid and minimise major | The list is intended not to be exhaustive. But these are important design considerations. The list provided goes beyond design. |

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| | environmental and social impacts". The Hydropower Sustainability Assessment Protocol (Protocol) can offer the comprehensive framework required to understand the full range of impacts of a HPP project. Overall, the variety of topics that the Protocol addresses, and provides guidance on, can be listed as following:<br>• Communications & Consultation<br>• Governance<br>• Demonstrated Need & Strategic Fit<br>• Siting & Design<br>• Environmental & Social Impact Assessment & Management<br>• Integrated Project Management<br>• Hydrological Resource<br>• Infrastructure Safety<br>• Financial Viability<br>• Project Benefits<br>• Economic Viability<br>• Procurement<br>• Project-Affected Communities & Livelihoods<br>• Resettlement<br>• Indigenous Peoples<br>• Labour & Working Conditions<br>• Cultural Heritage<br>• Public Health<br>• Biodiversity & Invasive Species<br>• Erosion & Sedimentation<br>• Water Quality<br>• Reservoir Planning<br>• Downstream Flow Regimes<br><br>Furthermore, the Protocol addresses a number of cross-cutting issues, such as, gender, corruption, legacy issues, transboundary issues, transparency, multi- | |

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| | purpose projects, integrated water resource management, livelihoods and grievance mechanisms. | |
| 89 | There are a variety of other downstream flow regimes management technique available in addition to EFlows release and re-regulating weirs, such as:<br>• Bank protection works<br>• Artificial spawning channels<br>Establishment of a compensation fund to allow for improvement in flood plain connectivity, flood risk management and flood plain ecosystem management | The SEA is focused on avoiding significant impacts in the first place, not funding downstream management measures as these are site specific. That said, funded measures have application as for example – biodiversity offsets. |
| 89 | Water quality management measures can include more than variable height intake and reservoir mixing options, for in:<br>• Vegetation management to address organic decomposition<br>Addressing pollutant from non-project activities (sewages, wastes, contaminated sites, etc.) | The SEA suggests the main measures related to hydropower-created impacts. |
| 90 | There are a variety of other sediment management techniques available in addition to flushing, such as:<br>• catchment treatment works – sediment catch structures<br>• sediment sluice gates<br>• water management measures to avoid turbidity or shoreline erosion<br>• reforestation and re-vegetation activities<br>measures to address land use practices | Sediment sluice or low-level gates are part of standard flushing facilities.<br>This design section primarily focuses on engineering project works, and does not include catchment management. |
| - | **<u>General appreciation</u>**<br>We would like to congratulate MONREC, MOEE, IFC and the Australian Government for this assessment. We believe the SEA can guide hydropower development in Myanmar towards more sustainability. The SEA is an impressive work providing an overview on risks (and in some way opportunities) that come with individual hydropower projects in Myanmar and in the individual sub-basins. It lays out next steps to develop planning, protection and licensing frameworks for the sector. It is a big step filling parts of a large gap and was desperately needed. Nevertheless, we believe the SEA | 1. The SEA is basin-wide (or system level) planning and is not driven by projects but by environmental and social sustainability. SSP is one tool to take this work further.<br>2. The SEA team were aware of the "Myanmar's electricity vision" published in 2016 by WWF. In relation to exports, the SDF recommends mainstem reservation—the mainstem projects are mostly for export to China and Thailand, whereas projects in the low and medium zone sub-basins are mainly for domestic consumption. |

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| | could improve on key elements and these should be directly addressed in the report and within follow up activities:<br><br>1) WWF strongly supports the visions of the SEA: *"**Sustainable** hydropower development based on **integrated** water, land, and ecosystem planning, balancing a range of natural-resource uses and priorities to achieve **economic development,** environmental sustainability, and social equity."* We however believe the SEA falls short from addressing hydropower development planning based on "**IWRM principles**" because a) it follows a "project-perspective" approach instead of looking into system-scale effects and b) when it comes to developing sustainable development pathways it "only" looks at environmental and social risks instead of including a range of other indicators, challenges and opportunities such as cost-benefit-comparisons, economic or energy market considerations. We must look at how systems of hydropower plants can be optimized for energy production, livelihoods and ecology at higher level. In addition to (cumulative) impact studies, a system-wide optimization approach is needed. **System scale planning (SSP)** is today recognized as the approach to ensure that decision making is based on clear understandings of trade-offs, risks and opportunities. Government on different levels are closely involved in the implementation and operation of hydropower plants, which is another reason for making careful planning using a range of indicators beyond risks a high priority. The current report recommends SSP only for a few catchments/sub-basins. **Therefore, we call for integrating system scale planning in the procedures at much higher level and making it a key element of the three-year SDF.**<br><br>2) We believe the **energy scenarios and projections used in the SEA** are not comprehensive enough. Alternative scenarios, (e.g. the report "Myanmar's electricity vision" published in 2016 by WWF and | 3. Agree that small hydropower projects can still have significant impacts at a site or watershed level. However, the scope of the SEA as communicated throughout all phases project with more than 10MW capacity to give due emphasis to larger scale projects with significant impacts. Further studies are recommended to include the assessment of small and micro hydropower projects and other renewables (solar, biomass, wind).<br>4. The SDF (spatial planning) can also be used to assess development plans for existing infrastructure (e.g. multipurpose or irrigation dams) alternative production opportunities (e.g. solar, wind or biomass)—although additional criteria may need to be included as the Sub-Basin evaluation was based on water-related developments.<br>5. Smaller hydro projects will not "automatically" be exempt from exclusion in the high zone sub-basins, the projects would have to be based on community needs and meet specific criteria such as understanding the significance of impact.<br>6. The Ayeyarwady, Thanlwin, Sittaung and Chindwin rivers are critical to maintain basin processes and functions and may also have notable effects on other areas such as delta and coastal processes. They have very large average annual flows – generally above 1,000 m3/s. The SEA states that consideration will be given to other mainstems in the future. There is already a project on the Bago River and the Tanintharyi River is within a high zone sub-basin. The Rakhine basin is mostly a series of watersheds draining directly into the sea.<br>7. SEA includes recommendations for improving ESIAs for hydropower projects, environmental flow requirements and carrying out ESs studies prior to, or in conjunction with feasibility studies. The Myanmar EIA procedures (2015) apply to hydropower projects greater than 1MW, in future it may be necessary to review the |

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| | partners) are not mentioned. Subsequently the SEA proposes a sustainable development pathway without reflecting enough on the **economic risks** of the projects it is assessing. Firstly, in the export centers (NPRC, Thailand; for which some of the discussed projects are supposed to be build) there are currently signs of overcapacity for electricity production. Secondly, photovoltaic production in the region is constantly getting cheaper, with in some cases reaching 2cts/kWh. Even if the development of PV and wind power should stay comparably slow, a considerable amount of new renewable energy will enter the regional and national grids in the coming years, which will challenge the long term economic viability of many hydropower projects. And thirdly, the dramatic changes to energy markets during the coming years (as seen in other parts of the world, e.g. in Europe) will have huge implications on challenges and opportunities for hydropower. This leads to the questions, who is carrying long-term financial risks on top of other often underestimated or neglected potentially enormous other risks (e.g. climate change, physical, environmental, potential need for decommissioning or upgrading). The SEA does not examine these developments (with implications for many decades) in detail or propose how to address them in follow up work.<br><br>3) We would like to stress that **small scale hydro** (< 10 MW, which is still significant) does not have negligible impact on rivers, but quite the contrary. The belittling of the impacts on the environment and communities made by small-scale hydro in the SEA are worrying. Reasons to be careful when promoting small-scale hydro are many. For example, impacts on connectivity do net necessary get smaller with smaller projects, and are not (linearly) correlated to project size (in e.g. MW). From our experience the cost-benefit of small scale hydro are less favorable per produced units of energy in most cases (costs include environmental and social impacts). | procedures. The EIA guidelines for HPPs also contribute to better understanding at the project level. |

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| | We also dispute the conclusions drawn in the SEA on run-off river projects. Apart from this term not having a generally accepted definition (which by itself carries the risk of being used as loop-hole), the possibility of storying water is only one of many possible indicators for the impact of a hydropower plant and does not allow classifying potential impacts by itself. Terms such as run-of-river are often used to conceal or belittle the impact of hydropower projects and we believe the SEA shouldn't follow suit.<br><br>4) We do support the idea of addressing hydropower development planning through **spatial planning**. It is also an opportunity to integrate stakeholders into the planning and decision-making process. But we strongly believe a spatial planning approach needs to include plans for (hydro)power development below 30/10 MW. As explained, this can potentially have large impacts, especially if referring to impacts per energy unit produced and on local communities. Also, the development and optimization of the production and grid system needs to include all the important productions facilities. A spatial plan should therefore also integrate long-term development plans for existing infrastructure (e.g. change in type of production or multipurpose dams) and alternative production opportunities (e.g. solar, wind or biomass).<br><br>5) We welcome the classification of three different zones and excluding hydropower development for **high zoned sub-basins**. This allows for a focused and precautionary approach to hydropower development.<br>We suggest increasing the amount of high zoned sub-basins and increasing the protection in medium zones areas.<br>We however strongly oppose that small scale HPP should "automatically" be exempt from exclusion in the high zone sub-basins.<br>Furthermore, the suggestions to hurry the development of a framework to enable "lower impact projects" in high zoned sub-basins | |

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| | is problematic. There is no apparent need to water down the findings and fundamental frameworks of the SEA, and this would be sending unnecessary mixed messages to investors. Small-scale hydropower plants have significant impacts on river processes which cannot be ignored. Further, the inexistence of examples for "lower impact projects" in Myanmar, and the lack of sufficient information on geomorphological, species population or ecosystem processes (and regulatory protection-frameworks thereof) make informed judgments to develop a framework that can protect valuable areas very difficult, if not unfeasible.<br><br>6) It is important to protect the key physical and ecological river processes (river flows, water quality, geomorphology, aquatic ecology, and terrestrial ecology) of all **mainstem rivers**. Identifying mainstem rivers in need of protection should not just rely on the Strahler-order of rivers, but rather be based on an assessment which rivers need to be protected to achieve the objectives stated in chapter 2.2. Therefore – and especially in view of a precautionary approach – mainstem river protection should also apply for the Bago, Bilin, Tanintharyi, and Rakhine basins.<br><br>7) The resources for EIAs and the performance thereof must be strengthened. For one, we are worried by the large size a project needs to have to justify an actual EIA. HPPs of 15 MW and smaller have considerable impacts on the environment, which more than justifies field assessments, especially in view of missing information and data for rivers in Myanmar. EIAs should be required for everything greater than 1-3MW. Further, there is a dire need to develop more concrete and applied frameworks for e-flows (including hydro-peaking and beneficial small and medium floods), sediment delivery, or fish abundance, diversity and migration. | |

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| **3** | *"Project-centered planning approach locks in the project siting at the prefeasibility stage with little to no consideration of the cumulative impacts of multiple projects within a sub-basin or basin, or on a mainstem river."*<br>Project-centred planning also doesn't investigate the opportunities of coordinated hydropower development or system scale effects. It should not only be the aim to minimize individual risks, but also to a) analyse cumulative effects per se, and b) look at the benefits of different hydropower sitings and system effects. | Agree, that is why the SEA is recommending that additional studies are completed to fill gaps at the basin and sub-basin level using a variety of tools. |
| **4** | "*The primary purpose of the SEA is to provide a "sustainable development framework" (SDF) […] Instead, the SDF provides a "first-edition" planning framework and a clear roadmap of recommended actions (i.e. policies, plans, studies, data gathering, and organizational arrangements) to implement and improve hydropower and related river-basin planning hydropower in each of Myanmar's major river basins to ensure both basin health and hydropower generation."*<br>To ensure optimized and sustainable hydropower development (economic, social and environmental) there has to be follow up work that brings in system scale effects, not only minimizing risks, but also optimizing benefits from hydropower development. Therefore, the SDF should more strongly ask for a basin planning that incorporates benefits, using approaches such as system scale planning. The Norwegian Hydropower Plan (Box 3, page 60) is an example of an approach integrating cost-benefit analysis. Due to the existence of new planning tools, optimization can now be made modelling system scale effects and applying a range of indicators across scale and sectors. | Agree, tools such as System Scale Planning (SSP) has been recommended in first three years of SDF implementation. |
| 5 | We suggest highlighting the extremely high fish endemism of the Irrawaddy (SOBA 4 findings) and Myanmar in general, and the reliance on freshwater fish for nutrition (and thereby health). | This is highlighted by the sub-basin zoning and mainstem reservation on the importance of endemic and migratory fish species. |

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| 18<br>And<br>58 | *"a 10 MW project was selected as the minimum size for*<br>*inclusion in the analysis because projects equal to and above this capacity are more likely to create notable adverse impacts as they are usually located on larger rivers, have higher dams and larger reservoirs, and create greater flow changes and cut river connectivity. While some projects with less than 10 MW capacity may have a greater environmental or social impact than larger projects, small projects were excluded to focus on the most significant cumulative basin impacts."*<br>*"All larger scale and higher impact projects should be excluded from high zone sub-basins, but smaller scale and lower impact projects could be considered if these projects can be developed within watersheds without unduly degrading key natural resources and socio-economic values. Such projects can play a prominent role in supplying reliable and affordable off-grid and grid-connected renewable energy to communities, utilizing local natural resources and new technologies."*<br>Smaller scale does not automatically result in lower impact. Since the SEA is a phased approach, we propose that in a first phase, all hydropower is excluded, until better information regarding the impacts and benefits of smaller hydropower within the context of Myanmar is better understood. | Disagree. There is a real need for power in many unserviced areas of Myanmar. These projects are still subject to environmental assessment above 1 MW, and other renewables may be more feasible. For example, stakeholders in Tanintharyi and other basins were concerned about high electricity costs and lack of access to electricity. |
| **20** | We believe the following paragraphs downplay the potential and utility of new renewable production capacities, especially wind and solar.<br>*"But in the short to medium term until 2030, further domestic fossil-fuel development or significant utility-scale renewables are unlikely to feature in power-development plans." AND "the longer term, despite an expected increase in the total installed capacity of hydropower, its relative importance in the energy mix will probably decline as the country adopts other forms of generation such as coal, gas, and renewables"*<br>All over the world electricity markets have been going through a new renewable revolution. "Solar PV is entering a new era. For the next five years, solar PV represents the largest annual capacity additions for renewables, well above | The SEA does not explicitly say that all projects are needed, rather that projects are recommended to proceed, if feasible, in the low and medium zone sub-basins first. The energy scenarios are provided only for context, the SDF is not developed to meet capacity (MW), it is to achieve a balance between power generation and E&S impacts.<br>We agree that more studies are required. |

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| | wind and hydro" (IEA, https://www.iea.org/publications/ renewables2017/). And still projections for solar and wind are increased every year.<br>WWF presented an in-depth electricity sector study named "Myanmar's electricity vision" together with partners. The study shows that the most sustainable scenarios (based on a full renewable development pathway) are not costlier than the alternatives. We are quite surprised that this SEA chapter on energy scenarios does not reference this work. The report showed that there will be considerable changes to risks, challenges and opportunities for hydropower. The study also showed that a diversified energy production based on a range of new renewables leads to less absolute needs for additional hydropower production then what the SEA suggests. Thus, we do not see any real evidence for the following paragraph:<br>*If hydropower development was foregone, some combination of these different generation sources could be used. Although this could make power supply more expensive, such a diversification might increase energy security if stable supply chains were secured."*<br><br>We therefore suggest to either refrain from making statements on possible energy scenarios in the SEA or include findings from the study "Myanmar's electricity vision". The report is online accessible and baseline data, assumption and modelling approach are made transparent and accessible (which, to our knowledge, is not the case for the energy scenarios underlying the assumption of the SEA). | |
| **P20** | There is little work known to us that investigates demand-side efficiency potential of current and especially future demands (apart from the study above). We believe potentials to be quite considerable, considering the low efficiency of end-user solutions currently installed in industry, businesses and private households. We therefore believe there is not enough evidence for the following paragraph and it should therefore be removed.<br>*"Given Myanmar's very low level of electricity consumption and prospects for demand growth, sector efficiency improvements and demand-side measures would only meet a relatively modest part of the* | Noted. |

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| | *rising demand, and at best delay additional generation-capacity needs."* | |
| **23** | *"Available capacity is about 50% of installed capacity due to poor maintenance. Two hydropower plants totaling 53 MW (Baluchaung 1 and Sedawgyi) and a gas-fired (GT) power plant (57 MW Thaketa) are being rehabilitated, and seven older hydropower plants totaling 528 MW are scheduled for rehabilitation."*<br><br>Rehabilitating and optimizing existing hydropower plants should be the first choice. However. the current discussion on developing hydropower for Myanmar – and this SEA – is centered around building new hydropower plants. Similarly, the projects discussed by the various stakeholders – and the projects which have been addressed by the SEA – focus on new, alone-standing infrastructure in currently undeveloped river stretches. For example, there is no information on how existing hydropower could be upgraded or re-designed (this is not the same as refurbishing, which should also be looked at when developing sustainable development pathways). In many places around the world the focus of hydropower development has moved from installing new dams in historically undeveloped rivers to screening and updating existing infrastructure and how it could be altered to produce more energy, be more economic or ecology friendly, or to answer to changing demands of the electricity markets.<br><br>A sustainable hydropower development pathway should tap into the potential of optimizing existing water infrastructure. Examples for technical and physical redesigning could be connecting new and existing storage lakes for pump storage, increasing active storage of existing infrastructure, increasing head loads or reducing losses by building new pressure shafts, developing new water intakes for existing powerplants or connecting existing powerplants and storage lakes to each other.<br><br>We recommend that these solutions – in combination with the potentials for refurbishing existing equipment – are more deeply described and investigated in the SEA, and/or a pathway to address this is made part of the SDF. | The discussion is not centred on building new projects, it is about understanding the E&S impacts of BAU hydropower development i.e. 69 proposed projects.<br>Agree, existing HPPs and multi-purpose projects are being rehabilitated and additional studies for optimizing existing hydropower are being conducted. |

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| 28 | We propose to add the following potential impacts to "Table 6-1: Major Potential Environmental and Social Impacts of Hydropower":<br>- Increase in greenhouse gas production (especially methane generated in lakes and reservoirs)<br>- Loss of dynamic and naturally occurring processes (yearly hydrographs, sediment, ...) that influence important trigger events for ecosystems and species.<br>- Reduction of sediment transport capacities due to reductions in flood magnitude and frequency: aggradation of river bed leading to instability/shifting and increased flooding.<br>- Coastline and delta erosion/degradation: reduction in downstream sediment load due to reservoir trapping causing increased costal erosion, increased saline intrusion, reduction of availability of ground water and vulnerability to tropical storms<br><br>Disruption of flow and sediment/micro-nutrient processes for agriculture and fisheries with potential impacts on health (downstream, deltas, coastal and deeper sea waters) | Revised. |
| 31 | *"Assess potential for fish passage and other mitigation options to reduce impacts"*<br>In most cases considerable impacts are to be expected on at least the size of fish populations, even with the best fish passage technology. We propose to inform the readers that impacts can never be completely reduced or mitigated, meaning that every hydropower dam will have sizable impacts on the fish population. Fish passages and downstream migration protection can only partly mitigate these impacts (for example to the point that individual species don't disappear). | Agree, however further research, technology and monitoring should be carried out. |
| 34 | We propose to mention the increased risk of large flood events and to address this misconception that large dams can retain large flood events. Examples from all over the world show that a) the capacity of dams to retain the biggest floods | Agree, have added the additional point to the loss of outflowing sediment. |

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| | is very limited (even in highly developed catchments) and b) once retention capacity is reached, the strong increase in flows pose an even greater threat due to false security that led to infrastructure in flood-prone areas. These risks increase in some basins (especially the Irrawaddy) due to changing river bed morphology resulting from increased sediment deposition and lateral erosion.<br>Further, we propose to add the following: *"…..The losses of outflowing sediment to the coastal zone would lead to coastal erosion and a reduction in the productivity of coastal and deeper water fisheries"* and increased vulnerability of coastal communities to natural disasters like floods and tropical storms. | |
| 35 | <u>Aquatic biodiversity</u><br>Further impact to aquatic biodiversity and productivity are to be expected due to changing "hydrological" triggers for aquatic species or changes to the natural dynamics of river beds (cp. the recorded impacts on salmonids in European and North American rivers which contribute to the extinction of species).<br><br><u>Terrestrial biodiversity</u><br>Rivers and the surrounding terrestrial plant and animal communities are interconnected. The changes to nutrient and micro-nutrient fluxes up- and downstream as well as lateral will have unpredictable impacts on terrestrial biodiversity.<br><br><u>Social</u><br>Social implications from increased flood risk, impacts on fisheries, and impact on coastal communities would be enormous. This applies for all river basins, but specially for the Irrawaddy. | Agreed. |
| 46 | <u>Integrated Hydropower Planning:</u> | Noted, beyond the scope of this study, could be included in follow up work. |

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| | We propose to suggest further inclusive (hydro)power planning which integrates system scale effects. This planning approach should not only be minimizing risks, but also optimizing cost-benefits of hydropower developments across scale and sectors. This will also allow to assess the needs for energy services and define the role for hydropower. | |
| P48 | *"Although similar impacts are created by HPPs in sub-basins, they only affect a portion of the total basin flow and aquatic habitat, whereas HPPs on the mainstem river affect the entire river discharge at that point and thus create a substantially higher magnitude of impact."*<br>We propose to add that it's not just the potentially higher magnitude of impact (on e.g. hydrology), but also that these projects will influence a much larger area or even the whole basin (and in most cases have large effects on deltas and estuaries), since river processes in relations to geomorphology, hydrology and connectivity are (inter)connected up- and downstream and reach far beyond the project site.<br>The magnitude of impact can be just as large at project site or within a sub-basin for non-mainstem dams (or smaller dams). | Agreed, will revise this sentence to ensure that it is clear that mainstem projects have an influence over a larger area (or basin-wide impacts). |
| **50 and more (e.g. 71)** | *"At present, no mainstem river for reservation is defined in either the Tanintharyi and Rakhine basins as they consist of multiple low Strahler Order rivers that flow to the sea, and there is insufficient information available to prioritize reservation of one waterway over another."*<br><br>Mainstem rivers are critical to maintain basin processes and functions and have notable effects on other areas such as deltas and coastal processes. The SEA recommends no development of any hydropower projects on Myanmar's mainstems, but does not include the mainstems of "smaller" basins. However, *"the maintenance of key physical and ecological river processes (river flows, water quality, geomorphology, aquatic ecology, and terrestrial ecology) is essential to preserving river-system health and ecosystem services (i.e. regulating functions and provisioning services). Maintaining river functioning requires the retention of river connectivity and the natural-flow regime in the* | The Ayeyarwady, Thanlwin, Sittaung and Chindwin rivers are critical to maintain basin processes and functions and may also have notable effects on other areas such as delta and coastal processes. They have very large average annual flows – generally above 1,000 m3/s. The smaller rivers are not included in mainstem reservation due to their average annual flows and Strahler Order. There is already a project on the Bago River and the Tanintharyi River is within a high zone sub-basin. There are no projects planned on the Kaladan River which is a major river in the Rakhine coastal basins. |

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| | *mainstem river and major tributaries in terms of quantity, frequency, duration, seasonal variability, and rate-of-change. These hydrologic features – combined with good water quality – maintain sediment flows, nutrient cycling, aquatic and riparian habitats, fish movement, and ecological cues (e.g. upstream migration, breeding)." (goal of SEA, page 5)*<br>Within these smaller (but still quite large) basins, the mainstem fulfil the same functions, just on a smaller, but still highly important level from national or even international perspective. Ecosystems processes in these basins depend just as well on the mainstems. At least until the contrary is not proven, they should receive the same protection (precautionary principle). | |
| **53 - 60** | <u>Hydropower Zoning Scale</u><br>*"A sub-basin with a minimum score of 11 and at least two biophysical factor scores of four or more was zoned High in recognition of the cumulative value of biophysical features in the catchment. Sub-basins with scores of 8-10 were zoned Medium, while sub-basins with a score of 7 or less were zoned Low. This classification resulted in 10 sub-basins zoned High, 21 sub-basins zoned Medium, and 27 sub basins zoned Low (Table 8-4)."*<br>We couldn't make out the reasoning for a cut off line of '11 and at least two factors scoring four or more'. We believe this classification is rather strict and it seem that it was chosen to reduce High Zone Areas. In view of a) missing data and information, b) a precautionary approach, and c) that a protection is only suggested for one of three zone-classes, we propose to develop the systematic in a way that will lead to a high value class that covers *at least* a third of the area (table 8.5), allowing a more focused and sustainable approach to hydropower development. In line with the precautionary approach we also propose to increase the protection of Medium zoned sub-basins.<br><br><u>Exception to the reservation</u><br>*"Reservation to maintain high conservation values – HPPs are excluded apart from smaller scale, lower impact projects considered on a case-by-case basis"* | Will include a description of the scoring in the SEA final report, the scoring was not done to reduce high zone areas – please refer to Sub-Basin Evaluation which provides a detailed description of all 58 sub-basins: https://www.ifc.org/wps/wcm/connect/f6aaa8d3-0954-4357-8648-bb5e5221d336/Final_Sub-basin+evaluation.14.02.18_Final+%281%29.pdf?MOD=AJPERES<br>Agree that small hydropower projects can still have significant impacts at a site of watershed level. However, the scope of the SEA as communicated throughout all phases project was to assess medium-large projects greater than 10MW capacity. Studies are recommended to include the assessment of small and micro hydropower projects, solar, wind and biomass.<br>**Demands from stakeholders:** As found in the Regional River Basin consultations there was understanding of the importance of electricity for local socio-economic development. The costs of electricity were raised as an issue in Tanintharyi and other remote areas. Community driven initiatives for small scale hydropower or solar, wind should be assessed on a case by case basis. |

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| | *"All larger scale and higher impact projects should be excluded from high zone sub-basins, but smaller scale and lower impact projects could be considered if these projects can be developed within watersheds without unduly degrading key natural resources and socio-economic values."*<br><br>Small scale hydropower does not automatically result in lower impact and the effect on river processes should not be trivialized. We therefore oppose the idea that small scale HPPs can generally be excluded from the reservation-approach. High Value sub-basins should generally not be "opened up" for hydropower development. For one, it under-mines the basic approach of the SEA of signalling to investors and stakeholders which areas should be focused on for hydropower development and which not. Further, there is currently not enough information, experience, or a strong legal framework for licencing hydropower and ensuring an "unduly degrading of key natural resources and socio-economic values".<br><br>We propose to improve the protection of Medium zoned basins. This could be done partly in the way proposed for High Value sub-basins by developing project screening criteria to determine if they can be developed without "unduly degrading key natural resource and socio-economic values in these catchments" (analogue chapter 10.3.3). Additional to the proposed criteria we would like to add the following principles to the discussion:<br>- Alternative sites and technologies are considered and compared<br>- No impact on important fish migration routes<br>- No impacts in areas with average to high fish diversity or abundance<br>- "Protect 80 percent of process unless contradicted" (meaning that in the absence of data and scientific proof that river processes remain intact, key indicators should not be impacted by more the 20 percent (e.g. continuous sediment delivery or low, medium and high flows)<br><br>*"Such projects can play a prominent role in supplying reliable and affordable off-grid and grid-connected renewable energy to communities, utilizing local natural resources and new technologies."* | |

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| | *"Projects of less than 10 MW capacity should be permitted if they meet the needs of local communities, but they are still required to adhere to the standard project-approval process requiring the preparation of an IEE and should not be approved if they have unacceptable environmental and social impacts"*<br>To our knowledge there has been no or little demands from stakeholders for this exclusion to support local communities. We do believe that small scale hydropower can and will play an important role for providing access to electricity in some areas of the country. It should however be developed together with local communities and stakeholders on state level incorporating cost-benefit analysis and in view of opportunities and risks of different development possibilities (including alternatives such as solar, wind or biomass). | |
| 59 | *"Preference should be given to true run-of-river projects over daily peaking and seasonal storage projects due to the lower degree of flow regulation. A run-of-river project is likely to have a lower impact on river flows than a storage project at the same site. Similarly, a storage project with minimal live storage volume compared to the river flow rate would alter flows to a lesser degree than a project with a large live storage."*<br>The capability of a hydropower plant to store water (hourly, daily, or seasonally) and the potential influence thereof on the hydrology is one of many factors that can significantly influence the impact of a hydropower projects. Further, many different interpretations exist on when a project classifies as a run-of-river. We therefore propose to restrain from using this term. The focus should lie in protecting river processes (connectivity, sediment processes, hydrology, water quality), ecosystems and their services. The "stamp" run-of-river project should not be used to get past an in-depth screening process that compares system solutions and power plants based on their impacts on river processes, ecosystems, societies and other criteria that the stakeholders deem important. | Agree, the mainstem reservation is based on upon maintaining and protecting river basin processes. For example, the Geomorphology and Aquatic Ecology and Fisheries ratings are based on sediment, flow, water quality and connectivity. |

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| 60, 88 | *"Projects of less than 10 MW capacity should be permitted if they meet the needs of local communities they adhere to the standard project-approval process requiring the preparation of an IEE* ***and should not be approved if they have unacceptable environmental and social impacts****."*<br><br>This interpretation of small scale hydropower is worrying. It basically assumes that small scale hydro (< 10 MW, which is still quite big) has negligible impact on rivers and therefore protection of the High zoned sub-basins should not apply for them – which we believe to be wrong.<br><br>The impact of small hydro per unit of produced energy is in fact in many or even most cases higher for small scale hydropower. It should therefore be planned and optimized the same way as large-scale hydro and not get a "free ticket" to be developed in high-zone areas.<br><br>The SEA and SDF were developed to support a sustainable development of large scale hydro in Myanmar. Discussions and stakeholder workshops were centred around this issue and the corresponding projects and river sizes. Therefore, the report and the recommendations should make recommendations for this only.<br><br>It would not be right to bring in an interpretation for one (significant) size of hydropower without preparing and discussing facts on this issue, the potential, and risks and opportunities for its development in Myanmar. The development of small scale hydropower would also have to include the discussion on alternative electricity production possibilities (such as solar, wind, or even biomass)<br><br>We suggest that the report proposes the same restrictions for small scale projects when it comes to high zoned areas; or, not discuss rules and regulations for small scale hydro at all, as it was not discussed enough in the SEA process. | The quoted paragraph clearly states that any projects with unacceptable environmental and social impacts are recommended not to be approved. There is no assumption that all such projects will have negligible impacts. |
| **64** | *The future direction of Myanmar's hydropower sector is difficult to predict given that it will be determined by many factors, including future power demand, the cost of hydropower over alternative power sources, and power export opportunities. The sector will also be influenced by the feasibility of individual projects, armed conflict in target areas, opposition to proposed* | The SEA is not promoting hydropower, but saying if developed it should not compromise basin health and key social values. |

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| | *projects, and other factors. But it is likely that new medium- and large-scale hydropower projects will play a significant role in the energy-supply mix in Myanmar.*<br>The current rapid changes to energy markets seen all over the world indicates the need to ensure optimized and sustainable planning of hydropower development that better incorporates future changes to energy production and grid systems, investigates system scale effects on rivers and the energy system, and doesn't only minimizes risks, but also benefits from hydropower development (e.g. costs and type of energy produced regarding its value to the future needs in the grid).<br><br>Implementing individual projects which have been identified to have relatively low environmental and social risks can still lead to an inefficient systems outcome. We suggest the SDF proposes a follow up work that looks at how systems of hydropower plants can be optimized for energy production, livelihoods and ecology on basin level. With system scale planning this can be optimized using a range of factors such a type of energy produced, direct and indirect production costs, cumulative impacts on fisheries or biodiversity and many others. A system approach also allows for comparison and optimisation of different hydropower arrangements in the face of different developments pathways for new renewable energy production. This should also include long-term development plans for existing infrastructure (e.g. change in type of production or multipurpose dams) and opportunities for other technologies (e.g. solar). The need for this kind of further assessment should be stated in this chapter. . | The SEA is focused on sustainability if developed, not on assessing alternatives. Such system planning is warranted but was not in the scope of the SEA.<br>SSP has been noted in the SEA Final Report as one option for system planning. |
| 64 | *The reservation of 10 High-zone sub-basins would result in no large proposed projects developed totaling 13,895 MW (Table 8-11) on the main tributary of three sub-basins (Mali Hka, N'mai Hka, and Tanintharyi). Development on side streams (watersheds) in these 10 sub-basins may provide important opportunities for renewable energy generation but should only be considered in accordance with yet to-be developed criteria restricting development to smaller* | See above. |

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| | *scale, lower impact projects that cumulatively will not result in undue degradation of important processes and values in each sub-basin.*<br>As mentioned above we strongly reject opening high-value areas through the current SDF approach, being it for small-scale, "run-of-river" or other classification of hydropower use which (in our view wrongly) signifies low impact. This would undermine the process and results of the SEA. As this process has shown, currently baseline information and licencing processes are not strong enough to ensure the protection of river processes, ecosystems and livelihoods. Opening up High valued sub-basins to hydropower should only happen in a second iterative run of the SDF (and after focussing on developing Low and Medium zoned sub-basins) and when baseline data has become better.<br><u>Suggestion:</u><br>*Development on side streams (watersheds) in these 10 sub-basins may provide important opportunities for renewable energy generation but should only be considered in accordance with yet to-be developed criteria restricting development to smaller scale, lower impact projects that cumulatively will not result in undue degradation of important processes and values in each sub-basin.* | |
| 47 & 90 | We'd like to point out that government and investors are still gathering initial experience with the IEE and EIA process and the challenges have proven to be many. For several areas (e.g. e-flows, beneficial floods, fish migration, sediment, hydro-peaking, …) there are no concrete standards or data sets that allow assessing, implementing, verifying or monitoring proposed projects. Existing guidelines (such as the stated "EIA Guideline for Hydropower Projects") are not concrete enough to bridge this gap. We believe there is an urgent need to develop very clear, concrete, and applied frameworks. This should be taken up more concretely by the SDF.<br>We also need to point out that HPPs of 15 MW and smaller have considerable impacts on the environment which more than justifies field assessments, especially in view of missing information and data for Rivers in Myanmar. EIAs should be required for everything greater than 1-3MW. | Comments on the EIA are well noted and many organisations are providing support to MONREC to improve the EIA system. But as noted before, it should primarily be about the level of likely impact related to smaller scale projects, not the MW. |

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| | The SDF should take pressures from the EIA system. This can be supported by e.g. not favouring small scale hydropower in High zoned sub-basins or by taking a staged approach with focussing on projects with the best cost-benefit ratio by introducing system scale planning. | |
| **P 87** | Joint Planning Committee<br>We propose that the joint planning committee develops further planning approaches based on system scale planning principles to ensure optimized hydropower development which, as described above, will also investigate alternative energy production possibilities (such as solar or wind), the optimization of existing infrastructure, economic value of different hydropower and energy system designs, and the risks and opportunities thereof.<br>Sustainable Hydropower Policy<br>We propose that planning principles will also comprise the principles described in the paragraph above. | This role would be beyond the Joint Planning Committee in the first instance. But further integration with the NEMP 2018 and other processes are acknowledged in the Final Report. |
| **P88** | We disagree with proposing procedure on how to develop HPPs in High zoned areas at this stage. We however propose to apply this procedure to Medium zoned areas. | Noted. |
| **P 89** | It should be mentioned that fish passages can only partly mitigate impacts from HPPs. International institutions and consultants, (let alone local consultancies and institutions) still lack experience when it comes to assessing possibilities and potentials of fish passages. This is underlined by the fact, that even in a high-level report such as this, there is no mentioning of guidance systems for descending fish.<br>Fish passages are often introduced into discussions to ease minds. They allows the illusion that technology will solve the connectivity problem of dams. However, experience has shown that fish migration generally cannot be restored to its natural effectivity with fish passages. | As above. |
| **92/93** | We agree that there is a need for a special focus to develop baseline information. This also underlines the need for strict protection of High zoned areas and a | Agree, SSP has been recommended at the basin and sub-basin level. And river basin planning is already underway in Myanmar i.e. AIRBMP. |

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| | better protection of Medium zoned sub-basins until better information is available and IWRM planning (e.g. using system scale principles) has been undertaken. | |
| **94** | We believe there should be another chapter on eco-system processes at a river level. There is a significant need to classify high conservation value rivers in Myanmar based on information on terrestrial and freshwater biodiversity and ecosystems. The current report provides an initial assessment of catchments with high level of potential risk to ecosystems concerning hydropower development. A more in-depth assessment should analyse rivers and river stretches in higher resolution, and focus on entire rivers in addition to sub-catchments. It should also include information on social and cultural values, river connectivity, and water quality. This assessment would lead to a map of high-value rivers and river stretches, with scientific and practical justification to be presented for further planning and dialogue in Myanmar (including being the basis for improved management and potential expansion of the KBA network; chapter 10.6.1.3). WWF international has developed an approach called the "Free Flowing Rivers" assessment which could be used as the methodology for this activity. We propose to make this assessment part of the "priorities for further research/studies" of the SDF implementation plan (table 10-3). | The WWF River Reach Classification and degree of fragmentation (DOF) and degree of regulation (DOR) were used in the aquatic ecology baseline assessment chapter and the sub-basin evaluation ratings. |
| **46, 60, 91 & 96** | A CIA is a first step to assess risks and estimate the impacts of several development activities. However, sustainable hydropower development should also compare benefits of different systems and allow a transparent discussion of the pros and cons of different development pathways.<br>Hydropower outcomes can be improved if planning is able to consider multiple economic, social and environmental benefits and constraints, and explicitly identify the benefits and trade-offs, thus, implementing IWRM principles. We therefore propose to not rule out system scale planning (SSP) instead of CIA in catchments which have already been partly developed. SSP allows to 1) identify system effects (pos. & neg.), 2) optimize through a range of indicators beyond ecological impacts, 3) handle complex systems within catchments, and 4) be used for stakeholder engagement better than a cumulative impact assessment. | Agree, that SSP is important in implementing IWRM principles. However, the CIA is an important tool alongside SEA and ESIA for the government to assess the risk and opportunities of proposed hydropower projects. |

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| | We believe that in many cases, even in partly developed catchment or basin, SSP instead of CIA would be called for (p.46, chap. 10.5.2., p.91)<br>We suggest making one instead of two paragraphs on SSP & CIA and explaining that depending on which questions need to be answered, the appropriate tool should be used (p.96).<br>To our knowledge, system scale analysis is currently the best-known approach to "Balancing the Utilisation of Medium and Low Zone Sub-basins" (p.60) and should therefore be mentioned.<br>We suggest applying system scale planning not only in sub-basins, but also on basin level, to introduce IWRM principles to hydropower planning on national level and thus achieving the SEA vision. | |
| **P 97** | We propose to list "Trial the basin-wide hydropower Rapid Sustainability Assessment Tool (RSAT)" in second position, as it should inform decisions taken on further planning and engagement tools (CIA, SSP) | RSAT could be an important tool, one of many, in the Myanmar context for identifying stakeholders as part of dialogue on CIA and SSP. |
| **P 98** | Table 10-2:<br>- RSAT activities are missing in this table. RSAT will help to inform and mitigate SDF screening procedures as well as other activities under policy, procedures and guidelines. There should therefore be a coordinated approach, starting to implement RSAT activities at an early stage.<br>Line 7 we propose to name this "CIA and/or SSP" procedure for hydropower cascade developments | The CIA and SSP may be presented as separate components for potential follow-up studies. |
| General | It is very important that the IFC's SEA does not conflate conflict with armed violence and, in doing so, only look at 'conflict' in relation to instances of active armed combat. Myanmar's civil conflicts are many decades old and rooted in deep seated grievances around power sharing, distribution of resources, a desire for greater ethnic autonomy and the trauma of many years of brutal fighting. While the dynamics of armed violence shift in relation to wider political dynamics, ceasefire agreements, etc, these underlying causes of conflict persist and need to be addressed if gains made to stability through ceasefire | Agree, the sub-basin ratings for conflict includes both current and historical conflict. The SEA also recommends that stakeholder engagement be expanded in relation to conflict to include EAOs, ethno-political parties, local communities and people in IDP camps or who have migrated and may wish to return to their traditional lands. |

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| | agreements are to be sustainable over time. Ignoring these dynamics risks potentially undermining an already very fragile peace process by exacerbating core grievances. Aside from the *prima facie* conflict sensitivity concern in doing this, it would also threaten the viability and success of long term and expensive investment projects such as hydropower installations if ceasefire agreements breakdown because core grievances of conflict actors were not taken into consideration in strategic impact assessments. | |
| General | It is important that the SEA clarify what it means by 'decision makers'. If this is to mean only Union Ministries and does not include communities or ethnic administrations, then the SEA method and recommendations will likely contribute to core grievances that cause ongoing conflict and may make agreement on a Union Accord more challenging. | 'Decision makers' refers to any entity responsible for approving hydropower projects across Myanmar. |
| 13 | "Case Study on Consultation with Local Communities Affected by Upper Paung Laung and Yeywa" – this case study doesn't seem to be on the SEA website; it should be made publicly available. | As with the consultations with Ethnic Armed Organisations (EAOs) the findings from these case studies has been incorporated into the Baseline Chapters and SEA Final Report. |
| 20-23 | 5. Energy and Hydropower Development<br>There needs to be greater recognition of different energy pathways and options.<br>While on page 4 the report notes "the energy market in Myanmar is changing with an ongoing debate over the proposed share of hydropower in the energy mix…", this section seems to downplay different pathways and options for Myanmar to realise energy security and 100% electrification. These include but are not limited to issues relating to: objectives (domestic versus export); transmission/distribution (expansion of central grid, mixed grid, and off-grid); generation mix (including renewables other than hydropower such as solar and wind; changes in cost-competitiveness); demand forecasts; and role of energy efficiency measures.<br><br>There should also be more attention to improving generation and distribution issues within existing projects. While the SEA points to related issues e.g.: | Retrofitting and improving the distribution and generation of existing projects are ongoing studies. There are numerous studies currently being conducted to address the broader energy needs by many other actors. The SEA is prioritising the E&S implications of BAU hydropower development i.e. 69 proposed medium-large hydropower projects in Myanmar.<br><br>Agree, the focus of the SDF is that all new projects are assessed against the mainstem reservation and sub-basin zoning plans. |

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| | significant distribution and transmission losses (p.20); need to rehabilitate some existing power projects, resulting in available capacity being 50% of installed capacity for some projects (p.23); and retro-fitting some existing irrigation projects, these options do not really feature in the SDF and implementation plan, with focus more on new hydropower projects.<br><br>Furthermore, issues noted above should be better reflected in the Sustainable Development Framework (SDF) and its implementation plan. In the next few comments below, some examples and suggested changes are provided. | |
| 20 | "…until 2030…significant utility-scale renewables are unlikely to be featured in power-development plans." We suggest this is deleted or explained further as this downplays the role of non-hydro renewables. For example, presentation by MOEE in July 2017, (see: https://mm.boell.org/sites/default/files/uploads/2017/07/re12.7.pdf) indicates that 1,460 MW of solar power projects and 6,538 MW of wind power projects have some form of agreement (MoU, MoA or PPA). This is approximately 8,000MW, which is more than three times the JICA NEMP figures for renewables (2,420MW), cited on page 23. And scenario analysis commissioned by WWF as part of its power sector vision, indicates e.g. under the Sustainable Energy Scenario (SES) approximately 14,000 MW from solar and wind by 2030 (page 127), which is more than the total JICA NEMP figures cited for hydropower. (http://d2ouvy59p0dg6k.cloudfront.net/downloads/alternative_vision_for_myanmar_s_power_sector_draft.pdf)<br><br>The above examples illustrate that there are significantly different figures and views in the potential role that renewables can play in what is currently cited in the SEA, and this should be better acknowledged in the SEA. This section also doesn't mention the potential that off-grid and distributed grids can play to meet electrification targets. Furthermore, as far as we are aware, there has been limited stakeholder consultation on the JICA NEMP. | Noted, the role of hydropower and other renewables in meeting energy demand considering rapid changes in the regional energy market are needed. |

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| 20 | The role of energy efficiency seems to be downplayed. There is potential for energy efficiency and demand-side management and is an area where further research should be conducted. For example, The ADB's 2015 study "National Energy Efficiency & Conservation Policy, Strategy and Roadmap for Myanmar" has identified a total average electricity savings potential at 25.26% of the total demand. We suggest the sentence below is deleted.<br>"Given Myanmar's very low level of electricity consumption and prospects for demand growth, sector efficiency improvements and demand-side measures would only meet a relatively modest part of the rising demand, and at best delay additional generation-capacity needs." | The SEA Final Report does not downplay the role of energy efficiency, the focus is to ensure that the siting, design and operation of proposed hydropower projects is in line with the SDF implementation plan and that new projects are screened effectively. |
| 25 | 5.6 Environmental Assessment<br>The SEA report notes that the Environmental Conservation Department (ECD), "lacks the capacity and resources to review numerous [EIA] submissions" and that there has been limited monitoring to ensure compliance. Issues around lack of capacity, resources and implementation need to be emphasised more and addressed in the recommendations, particularly as the SDF recommends a range of new – and improvements to existing - policies, procedures and guidelines. While policies, procedures and guidelines can help, they will not be sufficient to address key social and environmental impacts and concerns identified in the report, if there is limited capacity and resources to implement, monitor and enforce requirements. | The whole premise of setting up the Joint Committee and SDF implementation plan is to provide ongoing training and capacity building to MONREC and MOEE at the Union and State/Region level. For example, in the implementation of the SEA focal points have been provided from both Ministries. All GIS layers and planning tools will be handed over to both Ministries with training and guidance to be provided by IFC. |
| 29 | The report notes, "Many planned large-scale hydropower projects are in conflict-prone areas and legacy issues of past projects have not been resolved, resulting in widespread concerns on the links to armed conflict and historical displacement." Yet, the focus of the SDF Implementation Plan is largely on proposed projects. There needs to be more emphasis in the SDF Implementation Plan on resolving legacy issues of existing projects. Unless | This is a good suggestion, however would require further investigation on what mechanisms could be introduced to deal with legacy issues. For example, international safeguards (or lender requirements) may require that a hydropower developer is responsible for understanding and dealing with legacy issues at a sub-basin or watershed level. |

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| | legacy issues are effectively resolved with participation of affected communities, “widespread concerns” will remain. | |
| 39 | The SEA asserts that RCSS and UWSA "are generally unlikely to engage with the Myanmar Army under current conditions". This appears to be inaccurate. According to the Irrawaddy, the RCSS and Tatmadaw have had “… at least 25 armed clashes…” since signing the NCA in 2015 (https://www.irrawaddy.com/news/burma/rcss-postpones-shan-national-level-political-dialogue.html). These clashes are reported to have been increasing in 2018 (https://www.bnionline.net/en/news/rcss-tatmadaw-clashed-four-times-early-january). The UWSA appears, according to media coverage, to have avoided clashes with the Tatmadaw for a long time. | Revised. |
| 44-45 | 7.3 Summary of BAU Development Impacts and Lessons Learned<br>This section currently focuses on bio-physical changes. Given individual basin summaries (in section 7.2) include information relating to potential impacts on social and livelihoods and conflict, they should also be highlighted in the summary. As noted on page 33, BAU development would result in Ayeyarwady (53%) and Thanlwin (40%) basins having over 90% of total hydro capacity in the country. In light of this this, the Summary should draw on the information in the Ayeyarwardy and Thanlwin basin sections, and at minimum note that BAU would result in:<br>• Resettlement of huge numbers of people and “major disruption of livelihoods and social situation” (cited from page 68)<br>Aggravating grievances and conflict | Summary of BAU impacts to also included socio-economics and conflict. |
| 47 | Cumulative Impact Assessment (CIA). As the text notes, A CIA can assess hydro as “well as other proposed developments” to determine “carrying capacity”. Hence suggest adding that the scope of CIAs can include non-hydro renewables, which could meet energy or economic outcomes with less environmental and social costs. For example, IFC is supporting a CIA of the Mekong Basin in Laos, which will include all renewable energies. | Generally, CIA’s cater to the situation of the area in which they are conducted and will include pressures on the resource or address a range of different developments in a specific landscape. |

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| 52-53 | 8.2.2 Sub-basin zoning<br>Conflict should be incorporated into the sub-basin zoning. The report notes that conflict has not been applied as it is a "fluid situation subject to rapid change, and in some instances, can also be resolved and managed". While conflict is fluid, other sections of report note conflict in parts of Myanmar is also long-standing, deep-seated and not resolved for extended periods e.g. "Much of Myanmar's hydropower resources is located where military and political control and resource use have been **contested for decades if not centuries**" (emphasis added, p.70).<br><br>In light of the above and the SEA's stated objectives, which includes to "avoid unacceptable social, livelihood and economic impacts" and "recognize and manage conflict risks for more informed decision making"(p.5), conflict should be integrated into the basin zoning plan.<br><br>As noted in comments below, failure to include conflict (as well as social and livelihoods) in the basin zoning plan has contributed to these issues not receiving sufficient attention in e.g. Section 9: Basin Sustainability, which identifies some conflict-prone sub-basins as "priority for cascade development", despite SEA recognising the potential for hydropower to aggravate grievances.<br><br>At the very least, all sub-basins rated high or very high (i.e. with a score of 4 or 5), should have equivalent status as "high value zones" and subsequent sections of the report changed accordingly. | The SEA Final Report provides an overlay of conflict ratings (1-5) in relation to planned hydropower. The recommendations promote conflict-sensitivity analysis at a project and sub-basin level and broadening stakeholder engagement.<br><br>Conflict is acknowledged as a significant restraint to hydropower development. In instances where the precursors of armed conflict are present, hydropower development can potentially exacerbate conflict.<br><br>Revised that conflict sensitivity analysis is applied to all sub-basins. |
| 60 | Balancing utilisation of medium and low-zones:<br>"In early stages of SDF Implementation all medium and low zones should be considered for potential development" | Noted. |

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| | Suggest above is changed to incorporate conflict i.e. not all medium and low zones should be considered - sub-basins that have high or very high conflict ratings should be ruled out. This also has implications for other sections of the report e.g. 8.3 and 8.4 (including figures for rough guide to overall scale of future hydropower development, which currently includes 7,320 MW as an indicative figure for Mediu- and Low-zone development). This would also make the SDF more consistent with key premise and statement in the SEA that: "Sustainable hydropower development can only occur under peaceful conditions…" (p.72). | |
| 64-67 | 8.4 Sustainable Hydropower<br>We suggest the 'rough guide' figures (p.67) and text are revised taking into account comments above about incorporating conflict into sub-basin zoning. | Conflict will not be incorporated into the sub-basin zoning but is overlayed on all 58 sub-basins in Myanmar to inform decision-making and planning. |
| 69 | 8.5.2 Social Impact Assessment Provisions<br>Linked to our comment on section 5.6 EIA (p.20) above. In addition to the need for "more guidance", this section should highlight the need for more resources and capacity to ensure effective implementation and enforcement. This is particularly important as a key premise of SDF implementation in medium and low zones is the "full application of good siting, design and management principles to avoid and mitigate adverse impacts." Full application is not feasible without resources and capacity to review, implement and enforce principles and provisions. | Agree, capacity building and guidance will be provided as part of the SDF implementation plan. |
| 70 | The conflict chapter may need further analysis in order to represent how local people actually experience conflict and avoid giving a partisan account of conflict dynamics in Myanmar. For instance, the SEA says: "Even when EAOs have been cleared by the military from hydropower areas, there is little guarantee that they will not return to their indigenous territory, renewing conflict and threatening the security of project areas...". This does not give adequate attention to the view of many that it is often the method of 'clearing' areas by the Tatmadaw itself that creates insecurity and has historically involved | Noted. |

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| | numerous violations of International Humanitarian Law. The safety and security of civilian populations should always be the top priority for the government and any other actors. | |
| 70 | 8.6.1 Conflict as a Peace-Building Model<br><br>We appreciate the report noting that development should be "… an avenue toward peace rather than division and conflict." This deserves further attention. In particular, it should include more specific and actionable items including, *inter alia*:<br><br>• About who makes decisions and how these decisions are made<br>• Ensuring that decisions made at the Union Level do not violate political / ceasefire agreements or exacerbate grievances<br>• Recognition that the Nationwide Ceasefire Accord includes 'interim arrangements' provisions which recognise EAO administrations concerns over environmental issues, requires coordination with EAOs over the management of these issues, and requires consultation with EAOs and communities before large scale development activities.<br>• That certain decisions should wait until the Union Accord provided for in the NCA has settled how federalism will be applied to this topic<br><br>The reality is that for development to genuinely be 'an avenue towards peace' it needs to be approached as a peacebuilding exercise as well as a development project. Inevitably, this will require making decisions in a different way than may be usual for investors and developers and acknowledging that project timelines and processes may sometimes have to function in ways that seem inefficient or unnecessary from a purely 'project implementation' perspective. Without such recognition – and action – development will not be a pathway to peace but, almost certainly, contribute to further division and conflict. | Reviewed section 8.6.1 |

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| 71 & 91 | Precisely because conflict is dynamic, credible conflict assessments should be conducted in all potential project locations, and not only in those with a 4 or 5 conflict risk rating. Otherwise projects risk overlooking hidden or latent conflicts that may be exacerbated by hydropower projects. Where conflict risks are genuinely low, a conflict assessment will be able to report this to inform investors and developers.<br><br>In addition to measures to 'mitigate conflict risks' conflict assessments should also be able to recommend not moving forward with a project, including projects in any stage of planning. This should be added to list of bullet points under "These assessments should:" | Agee, an additional point could be included that the conflict sensitivity analysis may recommend that a project does not proceed under current conditions. |
| 72 | Section 8.6.3 Broaden stakeholder engagement<br>We appreciate the need for broader consultation, with CSOs, communities, including displaced peoples, and EAOs etc. However, there are important aspects of consultation that are not specified in the SEA and which should be clearly laid out to form a minimum standard for meaningful consultation and participation processes.<br>Consultations should be based on the principles of Free, Prior and Informed Consent (FPIC). The SEA should recognise that who conducts a consultation can affect what people or groups are willing to say, potentially limiting their freedom to engage in the consultation. Similarly, consultations should happen at an early enough stage that the results of those consultations can meaningfully inform decision making. A common complaint from civil society is that they are 'consulted with' only as a means to tick a box. The fact that they have been 'consulted' is said to be used to provide a veneer of legitimacy to projects when none of the issues or concerns raised in the consultation have been meaningfully addressed or even discussed beyond an initial information gathering exercise. Finally, the SEA should recognise that people need information in order for consultations to be meaningful. This needs to be provided in appropriate languages and provide enough background and specific detail to enable people to fully understand the issues and options they are being consulted about. | Agree, will summarise and include in section 8.6.3. There are also recommendations in Chapter 10 around enhancing stakeholder engagement. |

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| 74-86 | Section 9 Basin Sustainability<br>Linked to comments above, because social and livelihoods and conflict are not part of the Basin Zoning Plan's determination of high, medium and low values zones, insufficient attention is paid to "social sustainability" in descriptions of the basins. For example, Figure 9.2 Thanlwin Basin Sustainability, identifies Nam Pawn and Nam Teng sub-basins as a "potential priority hydropower cascade." As the text notes, these are conflict-prone areas, and in line with our earlier suggestion, we suggest sub-basins rated as high or very-high conflict should have equivalent status as high-value basins. Thus, we also suggest deleting mentions of Nam Pawn, Nam Teng and other conflict-prone sub-basins as "potential priority hydropower cascades" or "prime candidates for further development" | The Nam Teng and Nam Pawn are potential priority cascades, however a conflict sensitivity analysis would need to be undertaken at a sub-basin level prior to the commencement of any feasibility or technical studies. |
| 87-99 | Section 10 SDF Implementation Plan<br>Linked to some comments above, we suggest additional issues for inclusion in the SDF Implementation Plan:<br>• Energy Planning: there needs to be participatory comprehensive study, which examines energy options, pathways, and amounts needed to achieve energy security in Myanmar. This should also include recommendations for JICA NEMP, which to date has not conducted broad stakeholder consultations and also tends to prioritize large-scale centralized power projects over alternatives. Energy issues are a key comment raised by stakeholders on the SEA baseline report. While noting the focus of SEA was on hydro and not on detailed analysis of alternative power development strategies, the SEA response in the baseline comments matrix notes that, "The mitigation section of the report [i.e. now the SDF] will make recommendations about follow up research. It is likely that some recommendations will be a thorough investigation of alternative power generation options and demand side projections" (p. 60). This is missing, however, in the SDF Implementation Plan. A better understanding of alternatives can also help inform the screening | Agree, follow-up studies are needed and will be recommended as an important follow up to the SEA.<br><br>For example, the ADB are now commencing work on Integrated Resource Planning and other additional energy assessments will be carried out in Myanmar by other development partners.<br><br>The NEMP team has engaged with the SEA process through the formal consultation process and direct discussions with IFC and SEA team. Further assessment is needed of the NEMP 2018 and the energy mix when this report is released. |

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| | process, CIA and other current recommendations in the SDF Implementation Plan.<br>• Hydropower for domestic (energy) and export (revenue) have different objectives. Assessing other means of (foreign exchange) revenue generation from other sectors (e.g. tourism) may help identify other sources of export which would have less adverse impacts on the environmental and social values of Myanmar's river basins.<br>• Addressing legacy issues of existing projects needs to be prioritised.<br><br>Below are comments on existing parts of the SDF Implementation Plan. | |
| 87 | 10.1 Joint Planning Committee<br>Given issues and concerns documented in the SEA, the proposed Joint Committee's responsibilities should include engagement beyond government. We suggest an additional bullet point along the lines of: ensuring mechanisms for meaningful and on-going consultation with and participation of other stakeholders are established and maintained | Agree, will include an additional dot point for the Joint Planning Committee. |
| 87-88 | 10.2 Sustainable Hydropower Policy<br>Add public participation to last bullet point, so it reads: "incorporation of environmental and social considerations into **– and meaningful public participation in –** decision-making from the outset" | Agree, will include as last dot point. |
| 90-91 | 10.5 Impact Assessment and Management Planning<br>Linked to comment above, suggest adding another bullet point, which emphasises the importance of increasing resources and capacity to plan, implement, review and monitor ESIA measures. | Agree, capacity building will also be integrated into follow-up studies such as the CIA and implementation of zoning plan. |
| 91 | As noted above, conflict sensitivity analysis and assessment should be conducted in all potential project locations not only those with a 4 or 5 conflict risk rating. | Revised. |

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| 94 | Socio-economic: The need and importance for disaggregated data and gender analysis should be emphasised more, including with reference to SIMVA. For example, MRC Council Study (Socio-Economics Impact Assessment) notes that SIMVA "did not treat gender as a specific survey dimension and data class" (p.132), which limited ability to conduct reliable gender analysis. | Agree, will include this and to use similar tools to assess Gender i.e. Oxfam Gender Impact Assessment (GIA) which was presented to government and others in a gender and hydropower training in March 2018. |
| | **(1) The role of hydropower in national energy planning**<br><br>**Recommendation:** The SEA must acknowledge the lack of clarity surrounding demand estimates for hydropower and other energy options in the NEMP and recommend that these are made open to further assessment and scrutiny. As was suggested in the baseline comment matrix,10 the SEA must recommend a thorough and transparent assessment of demand side projections.<br>**Recommendation:** Consideration of 'sustainable hydropower' in the SEA should include retrofitting existing irrigation dams for hydropower generation. The SEA should recommend further assessments of the potential to retrofit existing dams.<br>**Recommendation:** The existing and potential role of small hydropower to meet the electrification needs of rural communities must be addressed in the report's analysis and recommendations. Even if HPPs below 10MW are considered beyond the scope of the SEA, the report must acknowledge and recommend further studies of the role of small hydropower in meeting energy potential among<br>the additional assessments identified in the recommendations.<br><br>**Recommendation:** The SDF must propose a comprehensive assessment of alternative energy options for meeting energy needs. This includes alternative renewable sources and distributed and off-grid options, together with examination of the potential of efficiency and demand side management. This assessment should be conducted through a transparent and participatory public process before any decisions are made on medium to large hydropower projects. | Agree, the SEA report will recognise the range (or lack of clarity) in estimates for energy demand. Will also consider a recommendation for the asset of potential for retrofitting existing hydropower, multi-purpose or irrigation projects for power generation. Future studies will be recommended to include the assessment of small hydropower, and other renewables. |
| | **(2) Assumption that hydropower exports are necessary and beneficial** | This is not part of the scope of the SEA. Other work is being done on regional power trading by the ADB. |

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| | **Recommendation:** The SEA must broaden its scope to examine the hydropower export policy and its alternatives or must clearly recommend this assessment as a necessary first step before decisions are taken on hydropower for export. | |
| | **(3) Methodology and recommendations based on sub-basin zoning**<br><br>**Recommendation:** The SEA states, "in the early stages of SDF implementation all medium and low zones should be considered for potential development" (p.59). This must be changed so that conflict-prone and areas of high social vulnerability are excluded or accorded equivalent status to high value sub-basins in the zoning plan.<br>**Recommendation:** The SEA must ensure that conflict and social and livelihoods ratings are included in the sub-basin zoning plan and the SDF by overlaying these themes on to the sub-basin zoning or through a similar method.<br>**Recommendation:** A further assessment of sub-basin zoning should be done, and included in the zoning plan, that includes considerations of energy needs and alternative energy options for each sub-basin, including the power options within the basin or through contiguous supply into the basin. | The statement says potential development only. Each project is still subject to analysis and assessment. This does not indicate a green light.<br><br>Disagree for the reasons stated in the SEA. Conflict and social and livelihoods ratings will not be included in the sub-basin zoning plan. The SEA has acknowledged the limited data available for social and livelihoods that can be aggregated at a basin or sub-basin level.<br>SEA Final will be reworded to ensure that socio-economic information is incorporated into sub-basin planning but is difficult for aggregating to the sub-basins.<br>Consideration of the energy needs and alternative options will be included in the recommendations for CIA, which includes other likely developments in the sub-basin or watershed e.g. transport, mining, agriculture, water supply where relevant. |
| | **(4) Sustainable Development Framework (SDF)**<br><br>**Recommendation:** The terms 'sustainable hydropower' and 'run-of-river' should be removed from the SEA report, or at the least, the limitations of these terms should be clearly acknowledged.<br>**Recommendation:** The SEA should include or recommend a comprehensive assessment of existing laws and policies in areas relevant to hydropower development (for example, land tenure), and identify policies and safeguards (beyond the SDF framework) that need to be in place before any medium to largescale<br>hydropower projects can be considered.<br>**Recommendation:** The limitations of the SDF in addressing broader questions of natural resource sovereignty and governance must be acknowledged in the report's analysis and recommendations. | Many efforts are already underway to improve the regulatory framework by various entities. As part of developing the Resettlement Procedures this would include to assess existing laws and policies e.g. National Land Law.<br><br>In the short-term, a commitment to a hydropower policy by both MONREC and MOEE and government will be prioritised before investigating potential for legal mechanisms to protect mainstems and sub-basins. The Thanlwin, for example, would require a transboundary mechanism to ensure mainstem reservation. |

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| | **Recommendation:** The SDF's policy framework could mention options for river protection for reserved mainstem rivers and sub-basins drawing on international legislative models and examples. | |
| | **(5) Major issues related to hydropower development not addressed**<br><br>**Recommendation:** The SEA must adequately acknowledge and address specific concerns and risks related to hydropower development in Myanmar that are referenced in the report but not addressed in the SDF or recommendations. These include, for example, hydropower legacy issues, the rights of displaced populations, as well as economic and viability risks due to changing energy markets and climate change. | Agree, legacy issues and the rights of displaced people could be addressed through the conflict sensitivity analysis. Climate change studies should be integrated in ongoing river basin planning processes and assessments, CIA and ESIAs. |
| | **(6) Consultations and participation in the SEA process**<br><br>**Recommendation:** The SEA should acknowledge and note the limitations and deficiencies in the stakeholder engagement process. | During the SEA, we have prioritized the environmental and social values of stakeholders, which are reflected in the main report of the SEA. From the government SEA focal points' perspective, it was the first time many of them had been involved in a stakeholder engagement process, which was coupled with training and capacity building. Civil Society Organizations in Taunggyi also recognized that this was the first opportunity for them to participate in consultations with State government representatives.<br><br>Our focus is not on the number. We have conducted a range of stakeholder engagements in different formats including face-to-face and small group meetings to larger national-level meetings. Our objective was to provide a range of options for individuals to provide feedback. |