

**An Independent Overview of:-  
“Environmental Impact Assessment (Special Investigation) On Hydropower  
Development of Ayeyawady River Basin above Myitkyina, Kachin State Myanmar,  
October 2009”**

**Introduction**

A study has been carried out to assess the potential impacts of seven dams proposed on the Ayeyawady River above Myitkyina in Kachin State. It was conducted by a team of scientists from both Myanmar and China. The study succeeded in gathering an unprecedented level of information concerning the rich biodiversity and natural resources existing in the catchment area of the dams and provides some foundation upon which to build a more comprehensive awareness of the potential costs and benefits of the proposed hydropower schemes.

The study also provides a startling insight into the wide range of crucial issues that remain to be properly examined and understood. Downstream impacts and the implications for fisheries, agriculture, navigation and communication are as yet poorly understood. The authors repeatedly comment on the need for further studies particularly of social and economic impacts as these have not been examined at all.

The study constitutes an environmental baseline study and biological impact assessment. In relation to the sequence of steps that should be taken before firm decisions are made about whether the dams should be built or exactly what dimensions, features and locations they should include, this study is clearly a preliminary study. As such it has identified more questions than it has provided answers. Standard procedures developed for the management of the Mekong River Basin by Chinese hydropower engineers would place this study at the pre-feasibility stage of the process. For the process to be fully realised it is clear that much more comprehensive and wide-ranging studies need to be carried out in order to adhere to a process that can ensure the best possible outcome for all the stakeholders involved. Prior to any decisions being made about whether to go ahead with construction, a full project environmental impact assessment (EIA) should be carried out. The current study provides an excellent foundation for the full EIA but cannot be substituted for such.

The study report identifies a wide range of stakeholders and decision makers that should have access to the study's findings. Many of those identified are yet to enjoy this access and therefore the purpose of the study has yet to be fulfilled.

The study makes a large number of recommendations including the development of alternatives to the Myitsone project. It is as yet unclear whether any of these recommendations are being considered.

**Report Highlights**

The study is a preliminary biological impact assessment. It is not a full EIA. Neither does it cover in any detail potential social and economic impacts. Its assessment of

biodiversity that potentially will be impacted by the dams is primarily focused on the catchment area of the projects, i.e. the environment upstream of the dams has been studied, while the downstream environment has not.

The report begins by noting the importance of the Ayeyawady River to the entire Myanmar nation.

*Ayeyawady River is the most important lifeblood river in Myanmar. Millions of people are depending on Ayeyawady River for their livelihoods. (It) acts as a conduit of communication to over fifty million people. (p.1)*

It briefly mentions the potential impact that the dams will have on the entire river.

*The fragmentation of Ayeyawady River by a series of dams will have very serious social and environmental problems not only at upstream of dams but also to very far downstream till to the coastal delta. (p.3)*

However the research carried out by the team was entirely conducted in Kachin State concentrating on the region upstream of the lowest dam on the river, Myitsone Dam.

### **Biodiversity Assessment**

The study identifies the region in which the dams will be constructed as “*nationally important, regionally significant and globally outstanding*” from a biodiversity perspective. It discusses the region’s identification as a global biodiversity “hotspot” by both national and international agencies and notes the large number of endangered or threatened species of flora and fauna that are known to exist in the region.

A team of scientists were given access to much of the catchment area in order to survey the flora and fauna in the inundation areas and beyond. Extensive surveys were made of the flora and fauna, perhaps the first such studies in the area for 60 or more years. A particularly thorough study was done of butterfly species. Other fauna surveyed included mammals, birds, reptiles and amphibians. Other than butterflies, no insect survey was carried out.

A survey of aquatic ecological conditions surrounding the dams was carried out establishing baseline data and assessing mitigation measures for the inevitable major changes that will occur in the aquatic environment as a result of the extensive damming proposed. The authors express concern for the maintenance of fish stocks, noting that in other river basins fish numbers have been dramatically impacted by dams. A number of recommendations are made for minimising the impact of the dams on fish, including the establishment of research institutions and collaboration with international agencies. So far there is little indication that these recommendations are being considered.

The results of the survey are disturbing. The team found that in many areas natural resources are already being stretched by unregulated human activities and they express concern for the potential of the dams to exacerbate this further, possibly to a critical point. The authors write that,

*The dam sites and watersheds of Malihka and Mayhka Rivers are within the core area for strict biodiversity conservation, and the dams and related facilities are close and within eco-regions, key biodiversity areas, and conservation corridors and in one of the world's centers of plant diversity. Definitely there will be negative impacts on potential of availability of traditional medicinal plants. Regarding agro-biodiversity there may be potential negative impacts on some wild rice varieties and their ancestors which are thriving well in Chebwe Township. (p.21)*

*The area has been extensively disturbed by past logging and shifting cultivation, and currently by poaching, so the additional disturbance caused by the hydropower project is expected to add more negative impacts. (p.21)*

*...when the constructions start huge influx of Chinese workers is imminent and there is a strong possibility of severe deforestation for fire wood. Another serious factor to consider is bush meat consumption. (p.21)*

*...wildlife species will be heavily disturbed and directly affected by clearing and logging of the inundation areas and follow-up construction activities... (p.21)*

In summarising the potential impacts of the dams the authors write the following:

*On account of the construction of a cascade of hydropower dams in Kachin State, there will be severe negative impacts on regionally significant and globally outstanding three ecoregions, one center of world plant diversity; severe impacts on key biodiversity areas and conservation corridors of Myanmar; severe impacts on livelihoods and habitations of grassroots people of the region; disappearance of some wild rice varieties and their ancestors; disappearance and forever loss of the cultural heartland of Kachin people (Myitsone); reduction of ecotourism potential and loss of ecotourism sites and cultural sites in Kachin State; and some wildlife species, terrestrial and wetland ecosystems may suffer considerably due to deforestation, loss of typical habitats and habitat fragmentation. (p.21-22)*

### **Report Recommendations**

The report makes many recommendations. As the report has not been made publically available and there is no open discussion about its findings or recommendations, it is unclear at this stage whether any of the recommendations are being considered or any action taken.

Of the many recommendations there are a number of ‘*immediate compensatory measures*’ and these are listed as ‘*prioritized actions*’. Two of these in particular stand out as requiring immediate attention and discussion.

### **Abandon the Myitsone project in favour of two smaller upstream projects**

First of these is the recommendation to abandon the Myitsone dam site because of the huge cultural significance of the Myitsone confluence for both the Kachin people and the people of Myanmar as a whole. The report notes that:

*The confluence of Mayhka and Malihka rivers (called Myitstone in Myanmar) will be totally flooded on account of dam construction below the confluence. The Kachins take pride of possessing Myitstone on their land. They consider this confluence, their cultural heart land because it is the birth place of the mighty Ayeyawady River, the value of the latter knows no bound for the whole Myanmar people. Loss of Myitstone will be a terrible tragedy for all of Myanmar people especially the Kachins. (p.40)*

The authors suggest that two smaller dams could be constructed upstream of the confluence, one on each tributary. They suggest that these could provide a similar amount of power without flooding the culturally important confluence site.

*With experts, find an alternative option to avoid construction of Myitstone Dam at the confluence. The best option would be to develop two smaller hydropower dams substituting already proposed Myitstone Dam and its location at appropriate two locations above the confluence of Malihka and Mayhka rivers. (p.25)*

*If Myanmar and Chinese sides were really concerned about environmental issues and aimed at sustainable development of the country, there is no need for such a big dam to be constructed at the confluence of Ayeyawady River. Instead two smaller dams could be built above Myitstone to produce nearly the same amount of electricity. (p.40)*

This recommendation, coming from a team of experts and scientists from both countries, is an outcome of the study that cannot be overlooked. The recommendation must be considered as it could allay the fears and concerns of millions. It also has huge ramifications for the thousands of people that will be directly affected by both the existing proposal and the new one. If the Myitstone project is abandoned in favour of two smaller dams, it will be a different group of villages that will need relocating to make way for the reservoirs. The authors suggest that 16 villages will be flooded by the two smaller dams whereas 32 villages would be flooded by the Myitstone dam as well as the vital cultural site of the confluence itself.

### **Creation of compensatory national park reserves**

The report recommends that as a priority, two new national parks should be established, one in the catchment areas of each of the two Ayeyawady tributaries (Malihka and Mayhka rivers), in order to protect the biodiversity in the region, compensate for the loss of habitat resulting from the dams and improve watershed management.

The report suggests that 1% of the income generated from electricity sales could be apportioned to fund the establishment and maintenance of these reserves. They suggest that:

*This prioritized action should be under a management team of various stakeholders including government authorities and departments of Myanmar, concerned Chinese corporations, scientific institutions from both China and Myanmar, environmental NGOs from both Myanmar and China, and local communities representing major races and various ethnic minorities of Kachin State. (p.22)*

**Other recommendations**

The report makes many recommendations to prevent, alleviate or compensate for the wide range of impacts that will be brought about by dam construction and operation. These include ensuring labourers have gas stoves and adequate supplies to ensure they do not destroy forest for firewood, reforestation, health care provision, fish management schemes, wildlife protection and numerous other important considerations. It is so far unclear if any of these are being seriously considered by the relevant Myanmar authorities or their Chinese counterparts. Many of these recommendations suggest the inclusion of NGOs, community organisations and other expert bodies. Further, the effective implementation of many of the recommendations will require a significant improvement in governance and administration which is so far lacking in the region and in Myanmar generally.

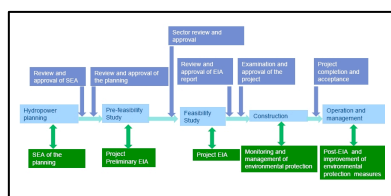
Until a greater degree of openness and cooperation is available from the authorities involved it is difficult to see how many of the disastrous impacts that the author’s recommendations are designed to prevent will be avoided.

**Critical analysis of the report and process**

The survey and report marks a significant improvement in the process of planning and constructing large dams in Myanmar. Unlike most other countries including China, there is in fact no legal obligation to conduct EIAs in Myanmar. However there are multi-sectoral planning documents for development in Myanmar that recognise the critical need for the EIA process. The fact that the authorities sanctioned such a process appears to recognise the massive and wide ranging impacts that the seven dams will have on the country’s most important river. The survey team should be widely commended for the significant effort they have expended in conducting the survey and writing up their findings. It is clear from their report the importance they have placed on this work, and the concern that they feel for the flora and fauna they have surveyed, as well the people that will be impacted by the projects.

Rather than providing a conclusive account of the potential impacts of the dam and the necessary steps needed to minimise them, the report in fact exposes how much there remains to be done. It is worth noting that current best practise in China would place this survey at an early stage in the process of designing and sanctioning the dams. According to the processes detailed in Figure 1, this study would fit into the pre-feasibility stage of the process. This would be followed by a sector review and approval, should the project move on to the next stage, a detailed feasibility study would then be conducted, a part of which would be a full project EIA.

Figure 1. Strategic Environmental Assessment (SEA) of Chinese Hydropower Planning



Source: - General Institute of Hydropower & Water Resource Planning and Design, [Http://www.hydrochina.com.cn](http://www.hydrochina.com.cn)

### **Full Environmental Impact Assessment requires much greater detail**

Based on the documents describing EIA process in the Mekong River Commission (MRC), a full EIA would have detailed assessments of the following:

- Basin & Catchment Ecosystems and Habitats;
- River flows and water levels;
- Flooding patterns;
- Wetland Ecosystems and Habitats;
- Irrigated Agriculture;
- Population growth in relation to domestic and industrial water use;
- Water quality (including suspended sediments);
- Saline intrusion in river delta
- Riverbank erosion and sedimentation/ channel erosion;
- Flood management in the lower basin and delta

The current assessment only covers the first of these issues. No assessment has been conducted of the river downstream of the dams apart from some fish sampling 20km down from the Myitsone dam site. Fish sampling was done at a time when migratory species were unlikely to be at the place of sampling, greatly limiting the information collected. While the authors refer to the literature on downstream impacts from large dams, no assessment of the Ayeyawady River's downstream environment has been made. This is no fault of the survey team's but was simply not part of the project's mandate.

The need for such an assessment is clear. The report notes that a large number of fish species found in the catchment area are migratory but the fish survey is confined to the immediate area around the dams. There is as yet no understanding of the relationship between the upper catchment area, which will be impounded by the dams, and the fisheries in the main river from the delta up to the first dam site.

The report also notes the changes in water temperature, flow and quality that will occur when the reservoirs are created. But again there is no study of how that will affect the river downstream of the Myitsone dam. The report mentions that, while the flow of cold glacial water from the two dammed tributaries will no longer reach the main river, there will still be some glacial flow from the Chindwin River. However, this neglects the fact that large dams are also being planned on the Chindwin River.

The report also mentions that the immediate downstream river flow will become similar to dry season flow all year round. But it makes no assessment of what impact this may have on river ecology, navigation, agricultural use or fisheries. There is also no assessment of the impact on the Ayeyawady Delta of the reduced transport of silt and sediment from the upper catchment to the Delta. This is of major importance considering the threats to the Delta posed by climate change. The survival of the Delta appears therefore to be under a double threat of encroachment from the sea caused by climate change and the reduced flow of land building sediment from the river's source.

The MRC considers that key environmental elements requiring careful management in the process of designing and operating hydropower dams include the following:

- Maintenance of wetland productivity and ecosystem services;
- Management of saline intrusion in Delta areas;
- Minimising channel effects on riverbank erosion; and
- Conservation of biodiversity.

It is so far unclear whether the first three of these has been given any consideration so far in the design of the dams proposed in Kachin State.

No social or economic impact assessment has been carried out and the authors repeatedly highlight the need for such an assessment throughout the report.

### **Conclusion**

An important first step has been taken to assess the potential impacts of the seven dams proposed in Kachin state on the upper reaches of the Ayeyawady River. Surveys of biological resources have been conducted. The significant threat to biodiversity in the catchment area of the dams has been highlighted and recommendations have been made to minimise these.

However, the assessment represents only a preliminary EIA and only assesses one section of the river, the section upstream of the lowest dam. The entire section of the river downstream of the dams has not been assessed and this is of paramount importance. Neither has any assessment been made of the impacts on people upstream or downstream of the dams.

It is not difficult to observe that the Ayeyawady River downstream of Myitsone provides enormous benefits to millions of people in Myanmar, along its main channel and across its impressive delta. While no assessment exists of these benefits and the potential threats posed to them by the dams, it is impossible to understand the costs and benefits of the proposed dams or potential mitigation strategies.

The proper process, a process now standard in China, for assessing the potential of a river basin for hydropower development and designing a coherent river management strategy has only just begun. This study can be considered an essential process step and those responsible for commissioning should be applauded.

On the basis of the information contained in the study, as independent reviewers, the authors of this overview: -

- Request commitment from the Chinese authorities governing Chinese international activities to ensure that standard Chinese development processes will be followed in full.

- Request immediate release and distribution of the EIA report to those for whom it was intended, and that the study document becomes public information.
- Request that all construction activities should be suspended until the full process can be conducted and a river management strategy that takes into account all aspects of the river, from source to delta can be designed.
- Request an immediate public statement and response regarding the study recommendation to abort construction of the Myitsone Dam and to consider alternatives as recommended.