

Brief review of TEAM Consulting Engineering and Management Co., Ltd. with respect to *Aquatic Ecology, Fisheries and Aquaculture* (AEFA) sections of their EIA (August 2010) report for submission to the CH. Karnchang Public Company Limited regarding the concept, construction and operation of the Xayaburi Hydro Power Project (XB HPP) in the Lao P.D.R.

DRAFT DOCUMENT

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As a brief independent review, this document represents just some of the main issues of concern regarding the Aquatic Ecology, Fisheries and Aquaculture (AEFA) sections of the recently released XB HPP EIA (TEAM) Report (March 2011). The issue of “aquaculture” has not been addressed in the EIA Report, so comments cannot be made on that subject.

Documents reviewed are referenced as R1, R2 etc.... within the available time frame for the summary review as shown below:

R1) Environmental Impact Assessment (EIA) of Xayaburi Hydroelectric Power Project, Lao PDR. Prepared by TEAM Consulting Engineering and Management Co., Ltd. for submission to the CH. KARNCHANG PUBLIC COMPANY LIMITED, Bangkok, Thailand (August 2010).

R2) Mekong River Commission Secretariat. Procedures for Notification, Prior Consultation and Agreement (PNPCA). Proposed Xayaburi Dam Project – Mekong River: PRIOR CONSULTATION PROJECT REVIEW REPORT (March 24 2011): 99pp.

R3) Mekong River Commission Secretariat. Procedures for Notification, Prior Consultation and Agreement (PNPCA). Proposed Xayaburi Dam Project – Mekong River. PRIOR CONSULTATION PROJECT REVIEW REPORT (March 24 2011). ANNEX 4: Fisheries Expert Group Report: 71pp.

R4) Warren, T. J. (2008). Initial Environmental Examination (IEE) for the Pak Lay Hydropower Project (PLHPP), Xayaboury – Vientiane Provinces, Lao P.D.R. Aquatic Ecology and Fisheries Component for (PLHPP) IEE (May 2008). Prepared for Norconsult Engineering and Management Consultants in association with Earth Systems Lao for submission to: China Electronics I&E Corporation of China, Sinohydro Corporation Ltd. of China and the Government of the Lao P.D.R. 51pp.

R5) Warren, T. J. (2008). Initial Environmental Examination (IEE) for the Pak Beng Hydropower Project (PBHPP) in Xayaboury, Oudom Xai and Bokeo Provinces in Northern Lao P.D.R. and Chiang Rai Province in Northern Thailand. Aquatic Ecology and Fisheries Component for Pak Beng (PBHPP) IEE (November 2008). Prepared

for Norconsult Engineering and Management Consultants in association with Earth Systems Lao (Lao P.D.R) and ASIALAB (Thailand) for submission to: Kuming Hydropower Investment and Development Institute (KHIDI) of China and the Government of the Lao P.D.R. 56pp.

R6) BARAN, E., MEYNELL, P- J., KURA, Yumiko., AGOSTINHO, A. A., CADA, G., HAMERLYNCK, O., NAO Thuok and K. WINEMILLER. DAMS AND FISH: IMPACTS AND MITIGATION (2009). WorldFish CENTER. Methods and guidelines to forecast, assess and mitigate the impact of hydropower dams on fish resources in the Mekong Basin. MRC-funded project No. 057 – 2008. DAM IMPACT FORECASTING ASSESSMENT AND MITIGATION: GUIDELINES FOR THE LOWER MEKONG BASIN (July 2009).

R7) ICEM International Centre for Environmental Management (2010). STRATEGIC ENVIRONMENTAL ASSESSMENT OF HYDROPOWER ON THE MEKONG MAINSTREAM. Summary of FINAL REPORT. Prepared for the Mekong River Commission (October 2010): 23pp.

R8) Kottelat, (2001). Fishes of Laos. Funded and supported by The World Bank, IUCN (The World Conservation Union) and the World Wide Fund (WWF).

Objectives of this brief independent review are to:

a) Highlight the main “shortfalls” of the TEAM Consulting Engineering and Management Co., Ltd. Xayaburi EIA Report strictly with respect to AEFA and any associated topics of immediate relevance to AEFA.

b) Highlight some of the highly relevant and comprehensive sections produced in the MRCS PNPCA report (including ANNEX 4) compiled by The Fisheries Expert Group (FEG) with respect to the TEAM EIA Report (AEFA sections).

c) Highlight some of the obvious lack of understanding by The EIA Group regarding the biology and ecology of some of the main fish species that are present within this review’s arbitrarily designated main impact zone from the Lao P.D.R.’s border with P.R. China downstream to Vientiane Capital City. This brief review acknowledges that negative impacts to fisheries may extend way beyond these two arbitrarily selected geographical points and may result from residual and unforeseen impacts. Examples of these might be changes in sediment transport, water quality, altered hydrology and other measurable and non-measurable parameters and issues that might have to be dealt with in some other type of context.

d) Highlight some of the main concerns regarding the XB HPP TEAM EIA and present some initial thoughts on the Project in general with regards to the EIA; made publically available at a very late stage before some kind of decision and / or agreement has to be made regarding the future of the XB HPP **based on a totally inadequate EIA with respect to AEFA.**

Major issues of concern and question marks regarding the AEFA component of the XB HPP TEAM EIA. My comments are in red font in the section below:

Why has the report been so poorly presented to the public, and appears only to be available as a scanned photocopy even on the MRCS website? Some of the text associated with some tables and graphs are difficult or impossible to read. The release of the EIA report by TEAM was untimely (March 2011) in that important meetings to address the issue of the fate of the XB HPP were due to take place in March and April 2011. This provided a very short period of time for any kind of basin-wide or independent review.

CHAPTER 1 (1-3). Under section 1.4 Methodology and Approaches. At point 5) the report reads “carrying out environmental impact assessment based on existing environmental setting / future trends and project features / operation plans. The EIA report simply does not do this, and the issue of impacts caused by the lengthy construction period (in excess of seven years) is almost totally ignored. See R2 and R3 above.

CHAPTER 2 (1-3). Under section 2.2.1.3 Coordination of Electricity Operation (bullet 4). Environmental Impact Evaluation (point 1). “Environmental impact evaluation shall describe all potential damages to the environment along with possible solutions or strategies in reducing such detrimental consequences to the environment, the ecological system, society, and natural habitat of wildlife”. The report falls completely short of that stated above in that all potential damages to the environment have nowhere near yet been identified. It does NOT provide this information, and is in direct contradiction of point (4) under “Conditions for Licensing Approval” that states “Proposed plan shall concur with the national social-economic development and not bring detrimental damages to the environment”. But the EIA report actually acknowledges that this is likely to take place. Evidence is provided in CHAPTER 4. Under section 4.1.2 Hydrology (4.1.2.1 Introduction). “The development of Xayaburi Hydroelectric Power Project by storing and regulating flows for electric generating will inevitably cause significant change in the original surface water flow condition. Hence, in this section of study, the following topic of investigation will be included: Then under c) “the probable effects on the Mekong flow regime as well as on other environmental elements”.

CHAPTER 2 (2-4). Under section 2.2.1.3 Coordination of Electricity Operation (bullet 5). Conditions for Licensing Approval (point 4). “Proposed plan shall concur with the national social-economic development and shall not bring detrimental damages to the environment. The XB HPP will obviously have a major detrimental impact on the environment. See R2 and R3.

CHAPTER 2 (2-5). Under section 2.2.3 Environmental Law of Lao PDR, National Assembly (No. 02/99/NA) and 2.2.3.1 (Prevention of Environmental Degradation – (1) Environmental Impact Assessment (point 5). “Environmental Impact Assessment shall include the participation of the local administration, mass organizations, and population likely to be affected by the respective development project or activity”. Is there any evidence of the above in the “very recently released” XB HPP EIA Report? Given that negative impacts to the environment (including highly important fisheries)

are almost certain to extend way beyond downstream of the XB HPP dam and into transboundary territory shared between the Lao P.D.R. and Thailand border regions, does the above apply to Thai citizens also? Have they had a chance to voice their opinions?

CHAPTER 2 (2-7). Under section 2.2.3.3 Environmental Mitigation and Restoration (bullet 1). Environmental Mitigation. “Environmental mitigation means prevention or response to occurrences, together with restoration and improvement of the impacts of the environment to its former, undisturbed state by establishing and fulfilling environmental quality standards, regulation and measures”. **This is very unlikely to take place with respect to Aquatic Ecology and Fisheries (AEF) in the case of the XB HPP. It can be hoped for, but I don’t think it can be achieved.**

CHAPTER 2 (2-7). Under section 2.2.3.3 Environmental Mitigation and Restoration (bullet 2). Obligations for Environmental Mitigation. “All persons and organizations shall have the right to send petition or complaint about any undertaking that can cause negative environmental impacts affecting human health, human life, animals, plants and environment”. **So there is an institutional process of feedback in place. Does this issue extend to construction phase also, or is this only restricted to operational phase? See R2 and R3 above.**

CHAPTER 4 (4-11). Under section 4.1.2 Hydrology (4.1.2.1 Introduction). “The development of Xayaburi Hydroelectric Power Project by storing and regulating flows for electric generating will inevitably cause significant change in the original surface water flow condition. Hence, in this section of study, the following topic of investigation will be included: Then under c) “the probable effects on the Mekong flow regime as well as on other environmental elements”. Under “Results of Study” (point (b) river channels) “There is a link between fish life-cycles, fish habitats, and hydrology. Migrating fishes respond to hydrological changes and use hydrological events as gauges for the timing of their migrations”. **The reader is directed towards Figure 4.2.1-2. in the EIA Report. By stating the above, even the EIA admits that there will very likely be changes to hydrology and some environmental elements.**

Hydrological conditions are just one of many factors that act as a fish migration **trigger** (an environmental “notice” for many fish species to “get moving” to other critical “life-cycle” habitats that are not available where they currently are available. This is **why fish**, and other organisms migrate and has evolved over the millennia to enable animals (fish are animals) to optimize their population status and to maximize their population’s chances of future survival in sufficient numbers).

CHAPTER 4 (4-44). Under section 4.1.3.2 Methodology (point 2). “The investigation of surface water quality in the Mekong River were performed by taking water samples 2 times to represent seasonal changes. The first one was collected during November, 2007 to represent wet season. The second time was in March, 2008 to represent dry season”. **I would suggest that just two random surface water samples, albeit at six sampling stations provide very little accurate data and information on water quality parameters. I would also suggest that the November 2007 sampling represents the early dry season period, and certainly not the wet season condition at all. The acknowledged wet season begins in May and ends in October and is**

influenced by the South West Monsoon wind season. The North East wind begins in October and lasts until about the end of April.

CHAPTER 4 (4-46). Under section 4.1.3.3 Result of Study. Literature Review (point 1 and bullet 1 *physically* under Table 4.1.3-1). “This variability has major implications for the number of samples required to detect statistically valid changes between locations and with time”. *Is this not an admission that the EIA sampling program was flawed, or is the EIA Report stating that variability was noticed and that the number of samples collected was sufficient and no further data is required? Bullet 2 then reports on water quality changes between Pakse (Southern Lao P.D.R.) and Kratie in Cambodia and suggests this is a function of a large change in river gradient between these two locations. I don’t see the connection between this information and the situation at XB HPP river section.*

CHAPTER 4 (4-50). Under section 4.1.3.3 Results of Field Surveys at point (a) First Sampling Period (November 23-25, 2007; Rainy Season). *I would strongly suggest that this does not represent the rainy season period at all, as is actually the start of the water recession period (i.e. the dry season).*

CHAPTER 4 (4-74). Under section 4.2 ECOLOGICAL RESOURCES (section 4.2.1 Aquatic Ecology, Fisheries and Aquaculture, 4.2.1.1 Introduction and 4.2.1.2 Methodology (point 2). “Field surveys and collection for aquatic organisms at 6 stations to represent the wet and dry seasons were conducted”. *The first sampling period November 23 to 25 does not represent the wet season and so the data are automatically invalid. Wet season data are missing from the EIA Report. What is presented are two dry season samplings; one during the early dry season period (November 23 to 25, 2007) and another towards the middle, or approaching the end of dry season period (March 10-14, 2008).*

CHAPTER 4 (4-74). Under section 4.2 ECOLOGICAL RESOURCES (section 4.2.1 Aquatic Ecology, Fisheries and Aquaculture, 4.2.1.1 Introduction and 4.2.1.2 Methodology (point 2). “All samples collected, particularly fish were identified, weighted and counted”. *The EIA refers specifically to the sampling of freshwater plankton at the six sites where Surface Water Quality, Aquatic Ecology (various elements) and fish samples were also taken. The references used in the EIA to identify the plankton samples by experts range from 1950 to 1978. It is by no means the case that dated references are no longer valid, but even the latest reference is by now 33 years old!!*

Given that the subject of Mekong animal and plant species / genus classification (including fish) is in a constant state of review and re-classification, were modern databases and literature used to positively identify fish from the six sampling stations? Table 4.2.1-1 and Table 4.2.1-2 provide many outdated scientific names for fish species. The Mekong Secretariat, 1994 is the referenced source and represents information from 17 years ago. A lot has changed since then! It is not sufficient to use the Remark: Presence is based on personal communications with representative of Thailand, Laos, and Cambodia fisheries agencies (Table 4.2.1-1). There are a number of highly competent people in the three riparian agencies mentioned who can identify many Mekong fish species. But, well-preserved specimens (and good quality photographs of fresh specimens suitably mounted) need to be

presented to them, or at the very least they should have been provided with very high-quality photographs from previous surveys and these backed-up with detailed discussions with riparian village fishers for tentative identification of fish species. This is not always an ideal situation, and is not scientific, but in some cases is, or becomes the only practical method given time constraints, logistics and limited budgets. There is nothing in the EIA document to suggest that even this latter inferior method was used. The only reference to any observation and discussion with local people is provided under the section on Methodology 4.2.1.2 (point 4). But the results of these highly important activities are not presented in the EIA Report. As probably the “**number one**” **most important negative impact** that the XB HPP will certainly bring about, fish identification and fisheries should receive the highest priority in the EIA document. But it fails to achieve this. The fish identification and description of large elements of the fisheries sections of the EIA are poorly presented in the extreme and should be discarded as anything like meaningful data.

CHAPTER 4 (4-76). Under section 4.2.1.3 Result of Study. Figure 4.2.1-3. “The most conspicuous member of this migration is the Giant Mekong Catfish”. It is actually probably the “least” conspicuous by observation (perhaps so “in the mind”) and its capture as a migratory fish species in the upper migration system and elsewhere in the Mekong system for that matter, is extremely rare. This is because it is critically endangered and is becoming an ever increasingly rare species and faces biological extinction in the wild without very careful protection provided and agreed upon by local fishers close to its spawning ground, and whose knowledge is paramount, regional and international fisheries experts. This could be partially achieved by protecting its only internationally recognized spawning ground in Northern Lao P.D.R. / Thailand and providing the animal with a migration corridor that it can use to full effect. Based on all available information and data at present the Xayaburi dam may actually cause the total extinction of the Giant Mekong Catfish in the wild. Any one of the six Mekong dams planned within the national borders of the Lao P.D.R. could cause the extinction of the Giant Mekong Catfish. Perhaps the XB HPP could be the first Project to do so. Expert opinions of riparian nationals and perhaps international experts are required here. Would the biological extinction of the Giant Mekong Catfish or the Giant Catfish of the Mekong, a remarkable and magnificent creature, be acceptable to the Governments of the Royal Kingdom of Thailand, the Lao P.D.R. or the nation of Cambodia?

CHAPTER 4 (4-77). Under section 4.2.1.3 Result of Study. Table 4.2.1-1. Fish species lists in this Table are utterly useless, not even vaguely comprehensive, meaningless and completely out-of-date, as is the content of Table 4.2.1-2.

CHAPTER 4 (4-82). Results of Field Surveys (point b? river channels (2)). First Period (November, 2007). (c) Fish species composition, size and distribution. “Altogether 37 species belonging to 10 families of fish were found from six river sites during the rainy season (Table 4.2.1-5)”. “The number of fish species in each family, number of each fish species caught and its length and weight for all six stations showed the distribution of fishes at each location (Table 4.2.1-6)”. It shows absolutely nothing about the distribution of Mekong fishes by either species or species assemblages or population composition. The data collected during the EIA surveys should be rejected as biased and non-representative of the resident,

sedentary and migratory populations of the fish species in the Mekong River, both upstream and downstream of the PROPOSED XB HPP dam site.

Over 800 Mekong fish species (represented by at least 50 different families) have now been officially identified by experts and are recorded / registered at / by various organizations and institutions throughout the Lao P.D.R., Thailand and Cambodia. This achievement has been the result of years of dedicated work by well-recognized regional and international experts as representing perhaps just over half of the total number of fish species that are present throughout the Mekong River Basin / Catchment. As a conservative estimate, I would suggest that there may be in excess of 200 species of fish present (migratory, sedentary and occasionally migratory or just resident) in the XB HPP main impact zone. Many of these fish species are of semi-commercial and subsistence importance. They need to move from the areas way downstream of the PROPOSED XB HPP dam site to specific areas above it, and then return back downstream again to important dry season refuge habitats. These seasonal movements of Mekong fish species are now well-documented and include those of the LMB UPPER MIGRATION SYSTEM. In reality, the scientific recording of 37 fish species over such an inadequate and short sampling period (November 23 to 25, 2007) is perhaps commendable on the part of the EIA Field Survey Staff involved with the field study, but does not even come anywhere near to representing the true number of resident, sedentary and migratory Mekong fish species within the main impact zone of the XB HPP. The data should be ignored.

CHAPTER 4 (4-82). Results of Field Surveys (point b? river channels (2)). First Period (November, 2007). (c) Fish species composition, size and distribution. "Altogether 37 species belonging to 10 families of fish were found from six river sites during the rainy season (Table 4.2.1-5)". "Fish sampled at large size". I'm not sure what this means exactly, but perhaps the EIA survey is meaning that large specimens of the fish species recorded were observed. If this is the case, then this is evidence of healthy fish populations. If it means that the EIA survey view these species as large, then they are wrong. At most, some of them are medium sized fish as adults, but most would normally be described as small fishes (< 50cm TL). But perhaps this is not what the EIA Report is suggesting.

CHAPTER 4 (4-82). Results of Field Surveys (point b? river channels (2)). First Period (November, 2007). (c) Fish species composition, size and distribution. "Altogether 37 species belonging to 10 families of fish were found from six river sites during the rainy season (Table 4.2.1-5)". "The total number, size range and total weight of fish sampled at each station showed a large proportion were in the middle stage of their life-cycle". There is nothing in the EIA report to support such a statement".

CHAPTER 4 (4-82). Results of Field Surveys (point b? river channels (2)). First Period (November, 2007). "One exotic species found in Mekong at Xayaburi by this sampling was *Cirrhinus cirrhosus* (migratory fish, **Pa nuan chan**)". *C. cirrhosus* is an introduced species, originally from Pakistan to Myanmar (Kottelat, 2001). If this fish was identified by fish taxonomic experts from the XB HPP surveys, then it must be accepted that this was the species. Another truly exotic fish species that was introduced to the SE Asian region several decades ago (primarily for aquaculture) is

Cirrhinus mrigala that forms part of the Indian Major Carp group of fishes. It too is in the Mekong River and is there because it has either been released deliberately (festivals etc...) or by accidents when floods take place at fish farms. Its vernacular name, in Thailand at least, is **Pla nuan chan**. There is a breeding population of a fish close to Paxan in central Lao P.D.R. that looks very similar to both *C. cirrhosus* and *C. mrigala* (personal observation). Here it is known as Pba soi geng. Only preserved specimens, high- quality photographs and detailed anecdotal information will be able to confirm which species is present in the XB HPP impacts zone. These do not appear to be available from the EIA Field Survey work in 2007 or 2008.

CHAPTER 4 (4-85). Table 4.2.1-4. SPECIES AND ABUNDANCES OF BENTHIC INVERTEBRATE ANIMALS FOUND IN THE MEKONG RIVER, XAYABURI HYDROELECTRIC POWER PROJECT (NOVEMBER 24, 2007). Data were collected at six stations on benthic organisms on the above date, and presented in Table 4.2.1-4 as individual organisms per square meter. Two PHYLA were identified (ANNELIDA and ARTHROPODA). The ANNELIDA identified belonged to a single class and one family. The ARTHROPODA were represented by a single class, two orders and two families.

At station 1 (2km below the dam site) we are informed by the EIA Report that 44 individuals from a single Family (Heptagenidae) were identified. As a remarkable coincidence, the EIA Report states that exactly 44 individuals of the Family (Tubificidae) were recorded at station 6 at a position 20km above the proposed dam site. But the above remarkable coincidence above looks set to repeat itself in Table 4.2.1-4. Not only is it presented in the EIA Report that the exact same number of Family Tubificidae (per square meter) are found at stations 2 and 3), but that also 22 individuals of the Family Chironomidae (per square meter) are found at stations 4 and 5. So, to summarize, the EIA suggests that benthic invertebrates are represented in total by 44 individuals at station 1 (approximately 2 km downstream of proposed dam site) and yet again the EIA reports that benthic invertebrates are represented by 44 individuals at station 6 (approximately 20km above the dam site. At the intervening sampling stations (2 to 5) only 22 individuals (benthic invertebrates) were recorded AT EACH OF THE FOUR STATIONS. This presents itself as a remarkable data set in the EIA Report. Perhaps this should be interpreted as “high benthic invertebrate populations above the proposed dam (20km upstream) and also 2km below it downstream. But in the intervening river stretches, where the dam is PROPOSED, only half (exactly) this number of benthic invertebrates was recorded.

CHAPTER 4 (4-87). Table 4.2.1-6. FISH SPECIES COMPOSITION AND THEIR ABUNDANT IN MEKONG RIVER AT SIX SAMPLING STATIONS XAYABURI HYDROELECTRIC POWER PROJECT (NOVEMBER 23-25, 2007). (4-94), section (c) “The standing crop in six sampling areas is sometimes difficult to calculate (estimate actually), because the different fishing gears used in different conditions of the sampling sites”. Yes exactly, and I agree. That is why the data presented in this particular EIA Report is of no practical value whatsoever in the assessment process.

“Suddenly the EIA Report presents a series of Tables listing the names of fish species and their families at each sampling station (1 to 6). The data on lengths and weights of fish species identified are completely irrelevant based on such small

sample sizes. What is the message that the EIA Report is attempting to convey here anyway. The standing crop (kg / ha) figures are meaningless and irrelevant and should be ignored until a much better-planned sampling program is proposed and implemented. All data represented in all Tables 4.2.1-6 (wet season NOVEMBER 23-25, 2007 and those at **CHAPTER 4. (4-96)**. Table 4.2.1-10. FISH SPECIES COMPOSITION AND THEIR ABUNDANT IN MEKONG RIVER AT SIX SAMPLING STATIONS XAYABURI HYDROELECTRIC POWER PROJECT (MARCH 10-14, 2008) should be discarded / rejected. They are meaningless and are mis-leading to the non-specialist reader. Standing crops need to be estimated by implementing a very special type of sampling program aimed at covering all major recognized fishery habitats over very specific time periods (situations change very quickly during periods of migration, and when fish migratory activity begins to slow down and all but ceases before the next mass movement takes place).

CHAPTER 4 (4-97). Table 4.2.1-10 cont'd). Species Diversity Index (SDI). This means nothing and data should be discarded.

CHAPTER 4 (4-98). Under section 4.2.2 Terrestrial Ecology. 4.2.2.1 Forest Resources. 4.2.2.1.1 Introduction. "The development of Xayaburi Hydroelectric Power Project would directly disturb the forest ecology, therefore, the potential impact has to be evaluated both in ecological and economic terms". Exactly so, and a good point made by the EIA Report. What is lacking in this statement in the EIA Report is the impact that forest ecology would have on the aquatic ecology (fish biomass being one of the most important considerations) when it becomes altered by the XB HPP.

Terrestrial and aquatic ecology are intimately related. Damage to the riparian environment at vast distances upstream and downstream from the XB HPP dam site will bring about negative impacts to the aquatic ecology and fisheries of the main impact zone of the XB HPP. The economics of the "disturbance to forest ecology", and the consequences of this requires a thorough revision in both ecological and economic terms" as the EIA so correctly points out. The EIA Report even continues at (4-109) under section 4.2.2.2.1 Introduction. "The project development may cause adverse effects on biological resources, especially forest and wildlife which are part of the ecosystem". Fish and Other Aquatic Animals (OAAs) represent a wide range of wildlife forms also.

Conclusions and preliminary recommendations:

1) The TEAM Consulting Engineering and Management Co. LTD., EIA Report concerning the construction and operation of the PROPOSED Xayaburi Hydropower Project of March 2011 is totally inadequate with its presentation of almost ALL aspects concerning Aquatic Ecology and Fisheries. Aquaculture is not referred to, so comments cannot be presented.

2) There are a number of important question marks regarding the effectiveness of a bi-directional fish-passage facility at the PROPOSED XB HPP. It should not be promoted as a means of "greasing the skids" to get the Project approved. It is, after all, based on a model that has been proven to work effectively for a number of migratory Salmonid species on North American rivers. The migratory fish populations

of Salmonids in North America, and the migratory populations of almost all Mekong fish species, are NOT comparable. They are so different in so many ways. The fish passage facility being PROPOSED at the XB HPP will not meet its objectives. The objectives are to maintain the migratory fish populations as they were before a barrage was constructed. The “fish passage” facility cannot even come close to this objective however good it may look on paper. Moving fish upwards and back down again doesn’t even begin to solve the problems that a mainstream dam will bring about regarding sustainable fisheries within the main impact zone of the XB HPP.

3) The XB HPP EIA Report *has probably been* hastily compiled and presented under pressure from the main “developer” CH. Karnchang Public Company Limited. This scenario of “minimum costs for field work” and “quick as possible” production of results with “minimum political risk” is now a common feature of the mega-scale -EIA process. It is a process that, in all reality, will ultimately “backfire” on the riparian populations of all of LMB Mekong countries. A much more lengthy (time period), well-thought-out approach to sustainable development strategy should be, considered. QUICK AND CHEAP AS POSSIBLE OPTION ATTITUDE NEEDS TO BE REVIEWED, so that best practice / informed decisions can be made by responsible authorities over an acceptable time period.

4) The PNPCA recommendation of a 10-year moratorium on mainstream dams below the Chinese border should be adopted by the LMB countries. The four LMB countries have, of course, the sovereign right to initiate, construct and operate all infrastructures within their own national boundaries. But please let us not forget that environmental impacts do NOT RESPECT or have ANY REGARD for mapped international borders. The inevitable negative impacts to aquatic ecology and fisheries created by the CONSTRUCTION and OPERATION of the XB HPP will not be restricted to the Lao P.D.R. It will extend to other downstream countries.

5) The entire part of the EIA regarding aquatic ecology and fisheries needs to be repeated over a much wider time-frame (years of carefully planned research). The present EIA with respect to aquatic ecology and fisheries remain totally inadequate and is very mis-leading to a non-specialist reader.

TJW

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