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# **REALITY CHECK OF THE WCD GUIDELINES**

**A Case Study for the Nam Theun 2 Hydro-Electric Project in Lao PDR**

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# REALITY CHECK OF WCD GUIDELINES

## Case Study For The Nam Theun 2 Hydro-Electric Project

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It should be noted here that the opinions and ratings given in this paper are solely those of the author, and that they are neither sanctioned by the Government of Lao PDR, the private developer, Lahmeyer International, Meritec International, nor by any of the international development banks.

## 1. DESCRIPTION OF THE NAM THEUN 2 HYDROPOWER PROJECT

### 1.1 Background

Lao PDR needs and is actively seeking foreign investment to develop export industries in order to earn much-needed foreign revenue. Currently the average GDP per capita is about US\$300 with only two main growth options, export of hydropower and tropical timbers.

The proposed Nam Theun 2 hydroelectric project (NT2), situated in central Laos, is approximately 250 kilometers east of Vientiane in Khammouane Province.

NT2 is an outstanding example of how the Government of Lao PDR (GOL) is working with the private sector to develop what will be a highly beneficial and environmentally and socially sustainable project.

NT2 represents a new and innovative approach to developing hydropower projects characterized by:

- Strong efforts to ensure broad community involvement in both design and the implementation stages.
- A broad partnership in carrying out state-of-the-art environmental, social and economic studies involving the GOL, the World Bank, private sector developers, local community groups and international NGOs.

The total cost of the NT2 project will be approximately \$1.1 billion (in dollars of the day) with an installed capacity allowing for a 920 MW intermediate-peaking delivery at the Lao-Thai border.

The Nam Theun 2 Electricity Consortium (NTEC) and the GOL are developing NT2 as a Build-Own-Operate-Transfer (BOOT) project. Under the proposed financial and contractual structure, the GOL will not be exposed to financial risks such as construction cost overruns.

The electricity generated by NT2 will be sold to Thailand by means of a tariff and offtake conditions agreed upon in a May 2000 MOU between the project developers (GOL & NTEC) and the Electricity Generating Authority of Thailand (EGAT). An additional capacity of 75 MW will be made available and sold to Electricité du Laos over the whole concession period.

The GOL will have a 25% shareholding in the ownership company, with an option to increase its share up to a maximum of 40% after 15 years from the commercial operation date. Full ownership of the project will be transferred to the GOL, at no cost, at the end of the 25 year concession period.

The NTEC partners will hold 75% equity in the project from the start. They are: Electricité de France (EDF) 35%, Electricity Generating Public Company Limited (EGCO) 25% and Italian-Thai Development 15%.

NT2 will generate about \$235 million in gross revenues from electricity sales per annum. The GOL's share of the overall cumulated revenues over the concession period will total over 45%, with only 25% equity shareholding, thanks to dividends, royalties and levies received. NT2 will contribute at least an additional cumulative 3.2 % to the country's GDP for the whole life of the

project. The revenues will be used by the GOL to implement much-needed poverty alleviation programs throughout Lao PDR, such as the improvement of rural education, vocational training, agricultural extension services, provision of irrigation water, the improvement of rural transportation, water and electricity supply as well as sanitary facilities. .

## **1.2 Nam Theun 2 and the People it Affects**

### **(a) The Nakai Plateau**

The NT2 dam to be built on the Theun River at the northern end of the Nakai Plateau will result in the storage of up to 3 billion cubic meters of water in a reservoir. The reservoir will be approximately 70 kilometers long and cover some 450 square kilometers (or about 40%) of the Nakai Plateau when full. Most of the area to be flooded has been severely degraded over the last decades because of shifting cultivation and logging and is of little environmental value, as compared to the whole catchment area that is still mostly covered with primary forest.

The advent of the reservoir will require the resettlement of 880 families in 22 village community groups to other nearby areas on the Nakai Plateau. World Bank Operational Directive 4.30 on resettlement stipulates that no family should be disadvantaged during resettlement, and none be worse off after resettlement.

NTEC and the GOL are committed to ensuring that each of these families will in fact be quickly and significantly better off after resettlement. Resettlement will only proceed after all independently audited consultations with the villagers to be resettled are completed and after the World Bank approves the Resettlement Action Plan (RAP) in the course of its appraisal.

### **(b) The Protected Forest Area**

From the start of the construction onward, the project will contribute \$1 million per year over 30 years towards the management of the NT2 catchment area or watershed, 3,500 square kilometers of protected primary forest area recognized to be of outstanding international significance in terms of biodiversity.

The project does not have a direct impact on this area and none of the people living there need to be resettled. This area is, however, under serious threat from various internal and external pressures and it is widely agreed that a conservation management plan needs to be implemented urgently. The conservation of this large pristine area of forest, potentially now subject to severe population pressures, will be of international importance. The area is being considered for World Heritage status.

By supporting a conservation management plan for this area, so that it remains as undisturbed as possible, NTEC believes three important project objectives will be achieved:

- The rights of indigenous peoples in this area will be protected and supported in accordance with the World Bank's Operational directive 4.20 on indigenous peoples.
- Compliance with the World Bank's Operational Policy 4.04 on natural habitats will be demonstrated. This is an essential element of gaining World Bank support for the project.

- The risk of deforestation of, and hence the generation of silt from, the catchment area is minimized. This is in the long-term commercial interests of shareholders, including the GOL.

### **(c) The Downstream Areas from the Powerhouse**

The NT2 project exploits the 350 m difference in altitude between the Nakai Plateau and the low lying area south-west of it. The power inlet will be located about halfway the reservoir. An underground tunnel and pressure shaft connect to the powerhouse. The turbined water will be captured by a reregulation pond and from there be led into the Xe Bang Fai River via a new waterway.

The downstream waterway coupled with the marginally reduced flow in the Mekong river for 150 kilometers and the additional flow in the Xe Bang Fai have relatively minor impacts on the adjacent populations for the most part.

Land loss and land use changes along the waterway and altered flooding conditions are the most significant. These are confined to the Gnommalath and Mahaxai areas, and will be compensated. Full compensation will be paid for the 24 houses and 17 barnes in the channel corridor, and for the areas of rainfed and irrigated land lost (about 100 ha). Channel crossings will be provided, and the entire area will benefit from the health program organized by NT2 and from the possibility of dry season irrigation.

The procedures to mitigate these impacts are addressed in the Environmental Assessment and Management Plan (EAMP) and the RAP. They largely consist of assisting in the present very successful moves to dry season farming of rice and other products. This has the effect of increasing production rates and avoiding flooding losses. A model farm, operated by NT2 since 1997, is demonstrating that many more crops than rice can successfully be grown in the area, improving income and food security.

## **1.3 The Role of the World Bank**

The World Bank first became associated with the Project when it commissioned a feasibility study of the site in 1990.

The Snowy Mountains Engineering Corporation (SMEC) undertook this feasibility study. The study ranked NT2 as the most economically viable hydroelectric project in Lao PDR. Its findings state that NT2 is an exceptional project topographically, hydrologically and geologically, as well as economically.

As a result, in 1993 the GOL decided to proceed with NT2 and awarded the development mandate to NTEC.

Since then the World Bank has dedicated substantial resources to assess providing a Partial Risk Guarantee (PRG) for part of the commercial loans required for the project. The PRG will enable funds to be borrowed at a lower rate, as it diminishes the level of risk for commercial banks. In addition the WB may support the execution of parts of the planned Environmental and Social programs in the Project Area and the Catchment Area by the provision of IDA loans to GOL. These loans will be accounted for within the GOL equity support for the Project.

The project is being developed by NTEC to not only fully meet but go well beyond the World Bank's social, environmental, technical and financial standards.

## 1.4 Due Diligence

In November 1996 the GOL, NTEC and the World Bank agreed to a program that involved five major studies and a public consultation process to examine the overall viability for the Nam Theun 2 project.

The main studies are:

- **Resettlement Action Plan** (NTEC)
- **Environmental Assessment and Management Plan** (NTEC)
- **Study of Alternatives** (Lahmeyer International in association with Worley International)
- **Economic Impact Study** (Louis Berger International Inc.)
- **Environmental and Social Action Plan for the Watershed Area and Corridor Areas** (World Conservation Union and Wildlife Conservation Society)

These five studies have been largely completed and have been subjected to much public scrutiny and discussion over the past three years.

The completion of the three GOL-commissioned studies and the two studies on resettlement and environmental impact undertaken by NTEC represent a milestone for the development of the project. All five studies have publicly addressed many important questions about the project and the study teams have consulted widely with those who have a stake or interest in the project.

The Alternatives Study has shown that NT2 is the most viable, as yet undeveloped, project in Lao PDR for the production and export of electricity to Thailand after extensive economic, social and environmental comparisons of all potential projects. About 20 variants of the Nam Theun 2 project, including the 'no-dam' option, were investigated in a multi-criteria analysis and compared to 20 other candidate IPP projects (all project with an MOU) in Laos PDR, and with thermal and nuclear plant, solar, wind and DSM projects in Thailand.

The Economic Impact Study has concluded that the project is economically sound, yet not too large for the Lao economy to readily absorb the investment required to develop it.

The study by the IUCN of the unique biodiversity area that forms most of the catchment for the NT2 reservoir has shown it has even greater value than previously thought and that it can be managed as a world class conservation area.

The NT2 Resettlement Action Plan has identified in detail how the lives of the 880 families to be resettled will be improved, taking them from their current condition of living below the poverty line to living safely above it. The RAP includes a detailed optimization of the planning and implementation processes.

The Environmental Assessment and Management Plan identifies how the environmental impacts can be managed and mitigated. The EAMP is being further developed in a way that emphasizes the necessary strengthening of the capacity of Lao institutions and of the processes that are needed to ensure protection of the Lao environment.

An unprecedented and on-going **public consultation and participation process** has ensured the transparency of all these studies. There are consultations on local, regional, national and international level. Stakeholder groups include all the project affected people (resettlement candidates, people otherwise affected), community leaders, district and provincial agencies, GOL ministries, local and international NGOs, World Bank and other financial institutions. All consultations are conducted in Lao language, and when non-Lao people are involved, also in English as a second language. Local representatives are being assisted by the Lao Women's Union and various NGOs. Direct expenses for the project affected people to participate in the public consultations are paid for by the project.

Over the past two years this has involved more than 200 consultations and public meetings in the project area and Vientiane, involving more than 5,000 people. These consultations have covered the affected people in the project area as well as given a voice to all the people of Lao PDR and the international community who wish to participate through the series of public consultation workshops. The comments and suggestions at these meetings have been important in improving the benefits of the project.

## 1.5 Independent Monitoring

Three internationally recognized and fully independent expert panels are scrutinizing the entire process of the Project development.

The World Bank has appointed a five-member International Advisory Group (IAG), composed of eminent persons experienced in the fields of political, institutional, economic, social and environmental aspects of major infrastructure projects from a National Government level perspective. This group, on its first review of the project proposals, concluded that on balance the economic benefits coupled with the poverty alleviation potential and environmental gains clearly outweighed any negative impacts of the project. The IAG paid a second visit to Lao PDR in the latter half of November 1998, and made their report public in early 1999. This report underlines that (i) once the macro-economic indicators start turning up, the social, environmental and general development case for proceeding to World Bank approval is strengthened, not weakened, by the current regional crisis, and (ii) were the project not to proceed, the prospect is that the Lao economy will languish indefinitely, the opportunities to make a dent in poverty will decline and the country's globally important biodiversity heritage within the project area will be irretrievably damaged.

A three-member Panel of Social and Environmental Experts (POE), appointed by the GOL and composed of eminent technical experts in all aspects of social and environmental effect of infrastructure projects, is equally supportive of the project based on the very significant work already carried out so far. They argue that the area of the Nakai Plateau to be flooded is severely degraded and therefore of little environmental value, but that the project will by way of direct funding help to preserve a vast primary forest of great international significance which makes up the catchment, and which is presently at risk. The POE made its fifth assessment visit to Laos during January 2001 and reiterated its strong support for the project. It also noted that the project was setting new high standards for effective management of resettlement and environmental issues with the potential to be a model of global significance.

A two-member Dam Safety Panel of Experts was appointed by GOL and composed by eminent technical experts in dam design, construction and associated geology. This panel has made one

site visit, and has visited the Project Design Office in France and the Hydraulic Modeling Test Site in Belgium.

## 1.6 Nam Theun 2 Project Update

In October 1997, the World Bank took a major step forward, deciding to proceed with the next stage of preparation prior to a formal appraisal process of the Nam Theun 2 project by the Bank. As further recent evidence of the forward momentum of this project, two important milestones required by the World Bank have been achieved.

**Firstly**, in March 1998, the Government of Lao PDR (GOL) formally advised EGAT of the inclusion of NT2 in the 3,000 MW Memorandum of Understanding agreement between Thailand and Laos, which has permitted tariff negotiations to begin.

At the first of the negotiation meetings, EGAT advised that its Base Load requirements for the foreseeable future were substantially oversupplied but that it had a need for Intermediate Peaking Power over 16 hours a day. EGAT therefore requested a change from NT2 previous Base Load delivery to a new operating mode on an Intermediate Peaking basis.

The Project has been designed with four units, the initial intention being that only three units would actually operate at any one time during 24 hours of the day. The fourth unit would be immediately available to come on line if any of the other three had to stop. The EGAT request has resulted in a change in operating mode to have the four units operate for 16 hours a day and about two units for the balance of the 24 hours.

The design has been adapted to increase the control capacity of the regulating weir, and detailed calculations and investigations have resulted in a volume of this facility of 5.8 million cubic meters. Its purpose is to retain the water discharged by one machine, of the four operating during the 16 hour period, and only discharge this water into the downstream system during the two unit running period, so that there will be only a small change in flow rates downstream of this weir >from the previous situation.

As it is water-flow volumes and rates that have environmental and social impacts, rather than the actual electrical energy delivered, there are no significant differential environmental and social effects of this planned change in operating mode.

Besides, the GOL and EGAT have each been updating their Power Development Programs, with a view to prioritizing the projects with the best chance of raising finance in the present economic situation. As a result of this process, the GOL officially informed EGAT that Nam Theun 2 was its number one priority and that all efforts should be concentrated on its timely implementation.

A **Tariff MOU** agreement was subsequently signed by EGAT and the developers on 26 May 2000 in the presence of the Lao and Thai Prime Ministers, paving the way for a **Power Purchase Agreement** to be concluded in the first quarter of 2001.

**Secondly**, in parallel with these important EGAT developments, the GOL and NTEC signed a Heads of Agreement on 16 November 1998, with current Concession Agreement negotiations planned to be also concluded in the first quarter of 2001.

Based on the commitments between the Lao and Thai Governments, construction of the Project will begin in mid 2002 and the progressive commissioning of the four main units will take place over the year 2006. This assumes a World Bank final agreement to provide its country-risk guarantee for the Project by early 2001 and a Financial Close in mid 2002.

The years of analysis and detailed study have clearly proved that Nam Theun 2 is an exceptional project, which should be completed as expeditiously as possible.

Based on the results of the five main social, environmental and economic studies, the large and sustainable revenue that will flow from Nam Theun 2 will assist Lao PDR to further its economic development in a sustainable manner and form the basis for major poverty alleviation programs throughout the country.

Clearly the Asian financial situation appears to be improving, though still providing some challenges in the development of NT2 as well as other projects in the region. However, the intrinsic qualities of the project, its relatively high proportion of local costs compared to coal or gas fired alternative projects, the strength and long-term commitment of the developers as well as the World Bank's support will all greatly assist in its successful financing and implementation.

(Note: Project Description largely taken from Nam Theun 2 Website [www.namtheun2.com](http://www.namtheun2.com))

## 2. THE WCD GUIDELINES

Established in February 1998 through an unprecedented process of dialogue and negotiation involving representatives of the public, private and civil society sectors, it began work in May of that year under the Chairmanship of Professor Kader Asmal, then South Africa's Minister of Water Affairs and Forestry and later the Minister of Education. The Commission's 12 members were chosen to reflect regional diversity, expertise and stakeholder perspectives. The WCD was created as an independent body, with each member serving in an individual capacity and none representing an institution or a country.

The Commission's two objectives were:

- to review the development effectiveness of large dams and assess alternatives for water resources and energy development, and
- to develop internationally acceptable criteria, guidelines and standards, where appropriate, for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.

In response to its mandate, the Commission began by assembling a consolidated knowledge base on the worldwide experience with large dams. To give its analysis and conclusions a solid foundation, it commissioned, organized or accepted:

- in-depth case studies of large dams in five continents, together with two country papers;
- a Cross-Check Survey targeted at 150 large dams in 56 countries;
- 17 thematic reviews grouped along five dimensions of the debate;
- four regional consultations; and
- inputs submitted by interested individuals, groups and institutions.

The work programme elements were mutually reinforcing. There were different levels of analysis and review. For example, different types and purposes for dams were assessed (at the basin, country and regional levels); different methods were employed to look at cross-cutting issues; different timeframes were used to assess issues, including retrospective and forward-looking perspectives; and, finally, different stakeholder groups and review processes were involved.

In terms of participation, the case studies involved interested and affected stakeholder groups looking at dams as a whole from a historical perspective and in the context of a specific country or basin; the thematic studies engaged review groups from all disciplines, regions and constituencies to look at past, present and future trends; the regional consultations included all constituencies in a debate of cross-cutting issues at a regional level.

Finally, the WCD Forum provided the Commission with a multi-stakeholder, international-level review of the knowledge base products as a whole, as they were finalized.

The Commission's recommendations can best be implemented by focusing on the key stages in decision-making on projects that influence the final outcome and where compliance with regulatory requirements can be verified. Among the multitude of decisions to be taken, the Commission has identified five key decision points. The first two relate to water and energy planning, leading to decisions on a preferred development plan:

- Needs assessment: validating the needs for water and energy services; and
- Selecting alternatives: identifying the preferred development plan from among the full range of options.

Where a dam emerges from this process as a preferred development alternative, three further critical decision points occur:

- Project preparation: verifying that agreements are in place before tender of the construction contract;
- Project implementation: confirming compliance before commissioning; and
- Project operation: adapting to changing contexts.

Social, environmental, governance and compliance aspects have been undervalued in decision-making in the past. It is here that the Commission has developed criteria and guidelines to innovate and improve on the body of knowledge on good practices and add value to guidelines already in common use. Seen in conjunction with existing decision-support instruments, the Commission's criteria and guidelines provide a new direction for appropriate and sustainable development.

Bringing about this change will require:

- Planners to identify stakeholders through a process that recognizes rights and assesses risks;
- States to invest more at an earlier stage to screen out inappropriate projects and facilitate integration across sectors within the context of the river basin;
- Consultants and agencies to ensure outcomes from feasibility studies are socially and environmentally acceptable;
- The promotion of open and meaningful participation at all stages of planning and implementation, leading to negotiated outcomes;
- Developers to accept accountability through contractual commitments for effectively mitigating social and environmental impacts;
- Improving compliance through independent review; and
- Dam owners to apply lessons learned from past experiences through regular monitoring and adapting to changing needs and contexts.

The Commission offers its criteria and guidelines to help governments, developers and owners meet emerging societal expectations when faced with the complex issues associated with dam projects. Adopting this framework will allow states to take informed and appropriate decisions, thereby raising the level of public acceptance and improving development outcomes.

(Note: Information assembled from WCD Website [www.dams.org](http://www.dams.org))

### **3. COMPLIANCE OF NAM THEUN 2 WITH THE WCD GUIDELINES**

#### **3.1 Approach**

The core values for development which constitute an overall guide to the WCD criteria and guidelines are:

- Equity
- Efficiency
- Participatory decision-making
- Sustainability
- Accountability.

The WCD analysis of dam projects resulted in 7 strategic priorities for future development:

- Gaining Public Acceptance
- Comprehensive Options Assessment
- Addressing Existing Dams
- Sustaining Rivers and Livelihoods
- Recognizing Entitlements and Sharing Benefits
- Ensuring Compliance
- Sharing Rivers for Peace, Development, and Security

Chapter 8 of the WCD Report elaborates the policy principles to be in place for successful implementation of each of those strategic priorities.

In Chapter 9 the WCD distinguishes 5 key decision points or stages in dam development:

- Needs Assessment
- Options Assessment
- Project Preparation
- Project Implementation
- Project Operation

The first two stages are on a river basin, regional or national level, and include all planning work up to feasibility study level for the most promising options to cover future water and/or energy needs. These stages fall under the responsibility of the Government. The other three phases are project related and can be the responsibility of the private and/or public sector.

Each stage is then correlated with the relevant strategic priorities. For each stage a criteria checklist is given to point out the main achievements (studies, activities, contracts) which must be in place before one can proceed to the next stage. It is recognized that this verification process will need to be tailored to suit the particular circumstances. Where appropriate, reference is made to individual guidelines, which explain in quite some detail how particular achievements can be met. A special list is made for projects under various degrees of development.

The second part of Chapter 9 then presents the 26 guidelines and attributes them to the seven strategic priorities. As an example the first 3 guidelines (1) Stakeholder Analysis, (2) Negotiated

Decision Process and (3) Free, Prior and Informed Consent are attributed to Strategic Priority 1, which is 'Gaining Public Acceptance'.

What is new in the planning and development approach is summarized in Annex A, while a complete summary of the WCD strategic priorities and guidelines is given in Annex B.

To investigate the compliance of the Nam Theun 2 project two alternative routes were followed, one based on the stage of development, and the other based on the guidelines.:

For the **first** one a checklist was prepared with the following hierarchy:

- Key stage of development (needs assessment, options assessment, etc)
- Relevant strategic priority (gaining public acceptance, comprehensive options assessment, addressing existing dams, etc.)
- Achievements to be obtained and, if relevant, the corresponding numbers of applicable guidelines (for example under comprehensive options assessment: the use of multi-criteria analysis to screen the full set of demand and supply options, referring to guideline 6)

For each achievement the check list indicates if the objective is or will be complied with, complied with exceptions or not complied with. A short explanation for the rating is given under 'Remarks'. In the corresponding spread sheet fuller explanations on the stage of development, the strategic priority and how the project meets or does not meet the stipulated objectives are given in the form of comment boxes which pop up when the corresponding spreadsheet cell is touched.

The hierarchy of the **second** checklist is as follows:

1. Guideline (*multi-criteria analysis, life-cycle assessment, green house gas emissions, etc.*)
2. Up to 17 objectives which may need to be fulfilled to achieve the desired achievement.

As for the first checklist it is indicated if the objective is or will be complied with, complied with exceptions, or not complied with. A short explanation for the rating is given under 'Remarks'.

### 3.2 Outcome

Annexes C and D show to what degree the Nam Theun 2 complies with the criteria and guidelines of the WCD. It should be noted here that the ratings given here are solely those of the author, and that they are neither sanctioned by the Government of Lao PDR, the private developer, or any of the international development banks. The reason for doing this exercise is to check whether a compliance check with the WCD criteria and guidelines can be done, and to see approximately where more work may be needed to facilitate compliance checks.

The main conclusions of the work presented in Annex C are:

- The NT2 project is almost ready for tendering. It is clear that for the key development stages 4 (project implementation) and 5 (project operation) there can only be the **expressed intention to comply**, but not actual compliance

- NT2 is mainly designed for power export to Thailand, and the Nam Theun 2 Study of Alternatives has proven that it is (by far) the best power export project in Lao PDR. It has however not gone through the formal process of Needs Assessment process as described by the WCD. Rather market forces determine if NT2's power can be sold to Thailand, from what date onward, and at what price. ***It is not so much a question of Needs, but rather one of Opportunities.*** The rating for the project for the Needs Assessment stage is generally 'compliant with exceptions', indicating that parts of the guidelines can be satisfied, while others cannot. The demand forecast for Thailand, for example, is the product of many Thai authorities and research institutions. It duly considers DSM and co-generation, which are both very successful programs in Thailand. It however is not the task of the NT2 project or the Lao Government to promote the removal of 'legal, policy and institution framework barriers' in Thailand which perhaps penalize or subsidizes particular energy technologies. Yet credit must be given to the Lao Government for implementing new legislation for the water, environment, energy and forestry sectors during the past few years. The new laws reduced uncertainty by giving new and more specific guidelines for the development of dam projects such as NT2.
- For Strategic Priority 'Existing Dams' in Stages 1 and 2, there is mention of solving **outstanding impacts by earlier built dam projects**. As not all impacts were predicted, some recently built hydropower schemes are evaluating and implementing additional mitigation measures. To delay the NT2 project because those measures are not completely and to everybody's satisfaction taken care of would lead to great financial losses for the country and is hopefully not meant by the WCD guidelines. The rating given is 'completed with exception' as the Government and private developers are working on the matter, but NT2 should not have to wait until these measures have been completed.
- Under Stage 2, Sustaining Rivers and Livelihoods, it is mentioned that sites with '**Major Impacts**' must be avoided. This is subjective and one-sided. It is better and more consistent to employ the multi-criteria analysis to find out which projects are attractive and which are not.
- For Stage 2, the formal establishment of **dispute resolution mechanisms** is proposed by the WCD. However at the time the Options Assessment (Study of Alternatives) was carried out, there was no such body in place, thus here a case of non-compliance. No major disputes arose during the public workshops.
- For Stage 2, Sustaining Rivers and Livelihoods, the WCD advocates a **fish passage** for every dam. In the case of NT2 that would make little sense however, for two reasons: (1) the downstream Theun Hinboun project already constitutes a barrier for fish migration to and from the Mekong, and (2) even if that project did not exist, migrating fish would have to negotiate some 70 km of lake, practically without flow velocity and different temperatures and pH-levels. It is doubtful if upward migrating fish used to flowing water would successfully reach the other side of the reservoir or downward migrating fish could locate the inlet of the fish passage. Thus a fish passage device may not be a correct prerequisite for all dams.
- Under Stage 3, Ensuring Compliance, it is stated that the license for the project should include the **financing of decommissioning**. The NT2 license period is 25 years, whereas the life time of the project is hundreds of years, thus no decommissioning needs to be financed in this time. The developer has not set aside a fund to finance decommissioning.

(If it is conservatively assumed that the lifetime of NT2 would be 100 years, and the cost of decommissioning some US\$300 million, then for a long term net interest rate of 5% p.a. the

amount to be set aside annually would only be US\$ 115000, equivalent to 0.05% of the annual revenues).

- Under Stage 5, Options Assessment, that the influence of **climate change** on the benefits and dam safety should be considered. Nobody can accurately predict what changes are going to take place, but probably the weather will be subject to more severe floods and droughts. A practical solution to the problem would be to design the dam in such a way that, at a later point in time when climate change clearly manifests itself, either the spillway capacity can be increased, or the dam can be raised, so that floods higher than the design flood can safely pass. This then is a design duty and belongs also under Stage 2 and 3.
- Under Projects in the Pipeline, Under Construction, it is mentioned that Stakeholders should agree to **operating rules** for the reservoir. It should be noted that for IPP hydropower plant it may be difficult to change agreed upon and contracted operating commitments without paying severe liquidated damages. The method of operation should be discussed and agreed upon by all parties involved before the Power Purchase Agreement is signed.

The main remarks on the work presented in Annex D are:

- Guideline 5, 'Precautionary approach ... *if impacts are irreversible*'. Can this be more precise please?
- Guideline 5, '**IA is independent from interests of the developer**'. This may not be always be efficient. If a strong PoE, totally independent, is in force, this should not be of concern. For NT2 the developer employs and pays for environmental and social experts and firms, but these are working independently, and their work is evaluated by the independent PoE. This model works well
- Guideline 7, Life Cycle Analysis. No compliance here, but indirect emissions from thermal plant were considered in the MCA analysis.
- Guideline 8, Green House Gases. No compliance. NT2 will not **measure GHG** emissions if long as there is no credit for GHG savings. The EAMP summarizes extensive studies which come to the conclusion that GHG emissions for NT2 are at all stages of project life significantly lower than any conceivable alternative
- Guideline 8, **Future Changes of Carbon Inputs...** Nobody in the world can predict such changes and the effect on climate change.
- Guideline 11, Economic **Risk Assessment: Hydrological Change** and the effect on benefits and costs. The NT2SA investigated a 50 year scenario in which dry season flows were gradually reduced to half their historic average. Wet season flows were increased in such a way that the average flow remained at its historic level. The result was a 0.5% reduction in the Present Value of benefits. But these are more crystal ball scenario techniques than forecasts. For smaller projects this may not be relevant at all.
- Guideline 14: Base Line Eco Surveys: Why the sudden change in names, is **environmental not the same as ecological?**

- Guideline 14: Scientific basis for **testing flow and quality scenarios against eco-system responses**. NT2 did not investigate scenarios to later compare them to each other. It only predicted the effect on the eco-system of a mandatory release of 2 m<sup>3</sup>/s plus spills to the downstream Nam Theun river, and of increasing the flow in the Xe Bang Fai by the (reregulated) turbine releases.
- Guidelines 14 and 15 overlap at times.
- Guideline 15: **Environmental Flow Releases**: The range of studies proposed is too long for small projects. The choice between scenarios is not only a question of environmental and social factors, but is subject to the full range of disciplines considered, including technical and economic considerations
- Guideline 16: Maintaining Productive Fisheries. As stated before the WCD advocates a **fish passage** for every dam, but this is not always appropriate.
- Guideline 19, **MRDAP**: in the case of NT2 the PAPs have a so-called Blue Book in which, for each family, the assets and livelihoods of the family members are detailed. The entitlement for compensation is detailed in the EAMP, which is an official document, but not yet entered in the Blue Book. The Concession Agreement between the government and the developer will detail the developer's funding obligations in support of the government mitigation measures for the PAPs. Likewise the CA will detail the government's obligations to PAPs. It is at this stage unclear if there will be an individual contract between the family to be displaced and the government
- Guideline 22: the **PoE** should at least have one host country national and one member supported by the PAPs. No compliance here, as the NT2 panel exists of 3 world renowned experts, all foreign. However on their fieldtrips they are always accompanied by a local expert in resettlement and by people from the areas visited. This is a for all parties acceptable arrangement. It is sufficient if the stakeholder community endorses the composition of the PoE.

#### 4. GENERAL COMMENTS TO THE WCD GUIDELINES

More general comments to the WCD guidelines are given in Annex E, and summarized as follows:

##### **Guideline 1, Stakeholder Analysis:**

- the stakeholder group should be able to dismiss any member from its group if there is an 80% majority for it. Needed to eliminate members who clearly boycott the project, who don't participate in meetings or don't contribute to them, etc., and
- If certain stakeholder groups need any kind of support, it should be made clear how decisions on this issue are made and who pays for it. The impression that the developer 'buys' the stakeholders should be avoided.

**Guideline 2, Negotiated Decision-Making:**

- Stakeholders should be able to influence decisions, but there are limits. It is not up to PAPs, for example, to help select the kind of turbines installed in the powerhouse
- Same as for Guideline 1: if certain stakeholder groups need any kind of support, it should be made clear how decisions on this issue are made and who pays for it. The impression that the developer ‘buys’ the stakeholders should be avoided.
- It should be made clear that decisions are made with majority vote. The situation should be avoided where the civil engineer blocks the construction of a multilevel intake, whereas the rest of the stakeholders are all for it. An adequately mixed stakeholder group and multi-criteria analysis, properly weighted, is essential.
- The objective that ‘The integrity of community processes should be guaranteed, they shall not be divided or coerced, and be free of manipulation’ should move from this to the next Guideline.

**Guideline 3: Free, Prior and Informed Consent:**

- The consent of the tribal and indigenous people affected by the project should be obtained at village level, to avoid only a very small minority stopping or delaying the project.
- The objective that ‘The integrity of community processes should be guaranteed, they shall not be divided or coerced, and be free of manipulation’ from Guideline 2 should move to this Guideline.

**Guideline 4: Strategic Impact Assessment:**

- Inter-sectoral studies should remain the responsibility of the government. The SIA studies are not to specify which percentages of government spending are targeted for education, health, roads and dam projects. The objective ‘covers entire sectors, policies and programmes’ should be restricted to the water resources and/or energy domains in the widest sense, and the results of the SIA are fed back to the Government, which may or may not change its policies depending on the outcome of the study.
- The objective of ‘Total integration of technical, environmental, social, economic and financial disciplines’ should be emphasized
- For developing nations the costs of these studies is prohibitive. Ergo: without support of international development agencies they will not be done. Also expertise not available locally. Concurrent execution in a multitude of countries will face personnel problems even internationally.
- That a precautionary approach is to be followed, that the studies should cover environmental, social, health and cultural heritage, and that there should be an independent Panel of Experts, which should be defined for project level IAs in Guideline 5, should be targets for the SIA as well

**Guideline 5, Project-Level IA**

- Project alternatives should not be selected on the sole basis of environmental and social impact, but rather through a multi-criteria analysis, as described in Guideline 6.
- That ‘the IA should be independent of the interests of the developer and that this should be reflected in funding’ is in principle correct, but if there is a strong and independent PoE the individual environmental and social experts, or firms having those experts, may well be engaged and directly paid by the developer.
- The guideline suggests a regular exchange of ideas between the technical and environmental teams, to which should be added ‘and with the stakeholders’

**Guideline 6, Multi-Criteria Analysis**

- That the MCA should take into account technical, environmental, social, economic, financial, regional development, political and other criteria should perhaps be added for clarity

**Guideline 7, Life Cycle Analysis**

- A full life cycle analysis is hardly financially viable for small studies. It is suggested that a few well-coordinated LCA’s are carried out for typical example countries and that other options assessment studies benefit from the results.

**Guideline 8, Green House Gases**

- Also here it is not affordable, for small projects in particular, to measure GHG emissions in the reservoir area and the river. A major measurement program for tropical reservoirs in particular is needed to develop sufficiently accurate ways to compute the GHG emissions.
- Major projects will not measure GHG emissions as long as there is no credit for GHG savings.
- The suggested consideration of future changes of carbon inputs for the catchment is difficult. Nobody in the world can predict such changes and the effect on climate change.
- Calculated GHG emissions due to use of cement, steel and construction machinery to build project also to be considered
- It should be added that in power sector studies net effect of hydro to be compared with other demand and supply options using LCA approach
- Also be added should be that, anticipated effect of climate change to be considered in design, for example by allowing space for extra spillway gate or possibility to raise dam at a later stage.

**Guideline 10, Distributional Analysis**

- To this guideline should be added that the distribution analysis forms basis for estimating cost to make all PAPs project beneficiaries. This cost should be included in the project cost estimate

**Guideline 11, Risk Assessment**

- The risk assessment should comprehensively look at ALL risks, including technical, economic, financial, but also environmental, social and political perspectives
- Explicit vulnerability to the effect of climate change can, as yet, not be accurately determined. But as stated in the comments to Guideline 9, the risk can be taken away by allowing space for an extra spillway gate or by the possibility of raising the dam at a later stage.

**Guideline 14, Baseline Ecosystem Surveys**

- Why switch suddenly from ‘Environment’ to ‘Ecosystem’?
- The guideline calls for a ‘scientific basis for testing flow and quality scenarios against ecosystem responses’. What exactly is meant here?
- The developing countries cannot afford these studies unless they get grants from the industrialized nations to undertake them. Local staff need to be trained.

**Guideline 15, Environmental Flow Assessment**

- Added to this guideline should be the consideration of the priorities of competing users in MCA fashion to select best overall EFR rules for dam in question

**Guideline 16, Maintaining Productive Fisheries**

- As explained for NT2, fish passage devices are not always meaningful and should not be categorically required. Where there is a reasonable chance that migrating fish will use the facility, they should be built of course.
- To be added to the guideline: first priority as fishermen are the PAPs, who - if they want - will be trained and equipped for sustainable lake fishery
- Guideline should also deal with changed fishery upstream of the reservoir

**Guideline 17, Baseline Social Conditions**

- Not only the State should be responsible for ensuring collection of baseline data, but even more so the project developer, who should also fund the surveys that are project related.

**Guideline 22, Independent Review Panels**

- Is this the same as the PoE for environmental and social matters, and if yes, why the change in name?
- IRPs are not only required for the project stages of development, but equally as well for the needs and the comprehensive option assessments

**Guideline 23, Performance Bonds**

- Who decides when the bonds can be partially released? Is it the stakeholder committee?

**Guideline 24, Trust Funds**

- Who decides when the trust funds can be partially released? Is it the stakeholder committee?

**Guideline 26, Shared Rivers**

- The guideline specifies that ‘if notified States do not respond in a reasonable and timely manner, the State should proceed with planning and development’. Isn’t it risky to proceed if the neighboring State does not want the project?

**Guidelines General**

- Where can something about terrestrial ecology be found?
- Where is the Environmental Assessment and Management Plan (EAMP) described, the equivalent to the MRDAP for the social side?

## 5. CONCLUSIONS AND RECOMMENDATIONS

This paper had the objective to test the practicability of the criteria and guidelines of the WCD and to test the Nam Theun 2 project in Lao PDR for compliance with these criteria and guidelines.

### 5.1 Technical Comments and Recommendations

The main conclusions are:

- Each project has a history and a future. Whereas ‘compliance’ can be confirmed for the past, there can only be ‘intended compliance’ for the future.
- In terms of enforcement of environmental and social issues, much will depend on whether the ‘intended compliance’ outlined in general terms in the EAMP, RAP and other reports is to be converted into an enforceable schedule of obligations, backed by appropriate remedies for breach in each case. The draft versions of the Concession Agreement and the Power Purchase Agreement show promise in this respect and set new standards among BOT contracts.
- If ‘intended compliance’ in the future is rated the same as ‘compliance’ in the past, then Nam Theun 2 can be considered compliant with about 90% of the WCD guidelines
- Of the ‘not compliant cases’ there are several instances where the project is not at fault, but something else, namely
  - The responsibility for fulfilling the guideline is not by the project (because it is government policy, such as declaration of intact rivers),
  - The target is too ambitious (modeling the changes and variability of hydrological change as a result of global warming on the project services and benefits)
  - The target is too far away or uncertain (setting up a fund for decommissioning, which may be hundreds of years away, with unknown developments in technology, prices, interest rate, etc.)
  - The target is too expensive (full life-cycle analysis for all demand and supply side options of the Options Assessment studies, which is certainly too expensive for studies in small poor countries)
- Thus the actual level of compliance of Nam Theun 2 is much higher than indicated before, provided that the intended compliance will over time be converted to compliance itself.
- As the Nam Theun 2 project is ready for construction and has complied with so many of the WCD guidelines prior to their existence, the project is an ideal testbed to check the workability of the WCD criteria and guidelines
- Already in their present state the guidelines to check the compliance the criteria and guidelines can be used to check the compliance of a project with the WCD spirit, as was demonstrated for Nam Theun 2. No project will ever reach 100%, but neither is that the target of the WCD
- The WCD criteria and guidelines are organized in two different ways. One way is according to the 5 stages of dam development, correlated with the seven strategic priorities and for each of these recommendations that may or may not be related to the disciplines., and then simply as 26 guidelines. For the other way there are just 26 guidelines with no reference to the stage of

dam development. It would enhance the guidelines if they themselves could have an inner time scale cross reference to the stage of dam development.

- Finally various suggestions have been made to provide more clarity and explanation to the guidelines.

## 5.2 Financial and Institutional Consequences

While most industrialized countries have already built most of the dams they want, this is not the case in the developing world. If the multi- and bilateral development agencies such as World Bank, Asian Development Bank, African Development Bank, etc) want the recommendations of the WCD to be taken seriously, then they also have to bite the bullet and support the developing world in realizing this by:

- Massive financial and institutional support. Grants for country wide multi-criteria needs and options assessment studies and feasibility studies for the best water resources and power projects. These should not be a mere update of old basin or country wide studies, but start more or less from scratch to have a fresh look. Time per country: 5 years per country as a minimum to prepare 15 year development plan, with feasibility studies for say the 5 most attractive candidate projects. Full public participation assumed. Cost per country (on average) perhaps 10 to 30 million US Dollar. Assuming about 100 such countries, the total cost of these studies alone is one to three billion dollars. If the full set of countries were to be investigated over 15 years, then the annual cost would be in the order of 60 to 200 million US Dollar.
- To equip the country with modern measuring equipment to execute base-line studies: provision of up-to-date equipment and adequate training to measure water quantity and quality, and occasionally fish migration, at key stations of the country. Computerization of the agencies responsible and programs for data entry and analysis. This could be done for, say 100 countries @ one to three million USDollars. This prerequisite for global baseline studies would cost some 100 to 300 million USDollar. To make data freely available to the world community, stations could be equipped with satellite communication facilities. This would add to the price of course, perhaps around 30%.
- Urgent execution of Full Life Cycle Analysis studies in, say, 5 typical developing countries, at some two million USDollar each, spread over 3 years.
- Urgent development of methodology and execution of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O measuring campaigns over a full year for, say, 20 hydro projects in tropical countries and development of generic formulae to compute the net emissions from man-made lakes, considering conditions in the reservoir, but also in the down- and upstream reaches of the reservoirs. These are elaborate studies, costing in the order of 0.3 to 1 million US\$ each. Total cost: 6 to 20 million US\$, spread over, say, 3 years.

An important question for the comprehensive options assessment studies is the availability of suitable specialists from the countries themselves and on the international markets.

Last but not least, it should be ensured that projects in an advanced state of development are not delayed until a comprehensive Needs and Options Assessment studies are done, but there may still be one or the other measure in the WCD guidelines which would be helpful, for example

performance bonds or trust funds for the execution of environmental and social mitigation measures.

**About the Author**

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Mr Oud has just completed a 1.5 year assignment as senior advisor to the World Commission of Dams. He also leads the Working Group 'Environmental Assessment' of the International Hydropower Association. At present he works as Owner's Engineer for the Nam Theun 2 project in Lao PDR.