

Practising Environmental Assessment Overseas: Experience and Lessons Learned

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Abstract

Performing Environmental Assessments in developing nations can present significant challenges beyond those encountered when applying Canadian EA systems and standards to projects in Canada. In this respect, it is useful to explore the answers to two questions:

- What are some of the challenges of practising EA to Canadian standards in a developing country? and,
- Despite these challenges, what can be accomplished to accrue the greatest benefits from an EA for an energy project in a developing nation?

This paper explores some of the main components that are common to EA processes and practice in Canada for energy projects, but which can present significant complications and challenges when practised in a developing nation setting. Lessons are drawn from experience in Southeast Asia and elsewhere to assist in future EA planning for energy projects in developing nations.

Addressed are such key aspects of EA as 1) timing and resources of a study; 2) discussion of project alternatives; 3) institutional arrangements; 4) carrying out public consultation and socio-economic impact studies; and finally, 5) some perspective on what can be accomplished to accrue the greatest benefits from an EA.

Experience with the Bakun Hydroelectric Project in Southeast Asia and elsewhere identifies a number of constraints which challenge EA practice in developing nations. These challenges include:

- narrow windows of “quality time” for carrying out EA studies within project life-cycles
- limitations imposed on the scope of discussion of alternatives; and,
- carrying out public consultation in foreign nations with languages, cultures and political systems different from our own.

However, despite these challenges, it was found that very useful EAs can be produced for energy projects in developing nations through:

- persistent coordination of effort and use of the project to facilitate communication links between agencies within the developing nation;
- using advanced communication technologies to access external information resources; and,
- promoting awareness of the utility of the EA for environmental management and due diligence during the full life cycle of the project.

1.0 Introduction

Good experience and a high international profile have given Canadian environmental assessment (EA) practitioners and the Canadian public a sense of self confidence that the standards^{*} of EA developed in Canada over the past 25 years are sound, responsible, and provide a secure system of environmental checks and balances for energy development projects (CEIA, 1997). However, performing EAs in developing nations can present significant challenges beyond those encountered when applying Canadian EA systems and standards to projects in Canada.

In this respect, it is useful to explore the answers to two questions:

- What are some of the challenges of practising EA to Canadian standards in a developing country? and,
- Despite these challenges, what can be accomplished to accrue the greatest benefits from an EA for an energy project in a developing nation?

This paper explores some of the main components that are common to EA processes and practice in Canada for energy projects, but which can present significant complications and challenges when practised in a developing nation setting. Lessons are drawn from experience in Southeast Asia and elsewhere to assist in future EA planning for energy projects in developing nations.

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2.0 Field Experience: Bakun Hydroelectric Project - Malaysia

2.1 Malaysia and the Bakun Project

Malaysia as a developing nation has worked diligently to pull out of the poverty cycle since it severed colonial ties with Britain in 1957-1963. Once a predominantly natural resource and agricultural based economy (forestry; rubber; palm oil), the South East Asian nation actively promoted industrialisation (petroleum; automobiles; electronics) during the late 1980s and early 1990s and was sustaining growth rates of 8% per annum until the recent economic crisis in the Far East (IFC, 1991; Wright, 1997). To respond to this growth in terms of energy planning, the Malaysian policy is one of decreased reliance on foreign oil, and increased reliance on domestic reserves of natural gas and hydroelectric potential (Ekran, 1995).

^{*} "Standard" here is used in the more general sense of the word, not referring to any specifically recognised national or international standard. A CSA Standard for EA Screenings is currently under development, and therefore not yet in place in Canada.

In early 1994, the nation began planning for a 2400 MW hydroelectric project on the Bakun rapids, approximately 320 km up Rajang River in the interior of Sarawak, the largest of the two Malaysian states on the island of Borneo. The Bakun Project was to involve construction of a 205 m high dam, creation of a 700 km² reservoir in a recently harvested tropical forest area, as well as development of an ambitious high voltage DC transmission system of over 670 km of overhead lines and 650 km of undersea cables to traverse the South China Sea to the demand areas peninsular Malaysia (Figure 1).

Until its recent abandonment, the (\$US 7 billion) Bakun Project was being carried out by a Malaysian development firm under a privatisation scheme, with funding arranged mainly from domestic sources.

2.1 Environmental Assessment of the Bakun Project

In March 1994, the Universiti Malaysia Sarawak (UNIMAS) through its Centre for Technology Transfer & Consultancy (CTTC) was appointed to coordinate the Environmental Assessment of the Bakun Project. A Technical Proposal for the EA study was prepared by UNIMAS in collaboration with ten other sub-consulting firms and institutions. The proposal was presented to an ad hoc Review Panel of the Malaysian Department of Environment (DOE) in August 1994. During this meeting, the State Government of Sarawak announced that studies related to social aspects of the planned resettlement programme for the project would be undertaken by the State Government, and that all consultation with the Orang Ulu Longhouse people residing in the proposed reservoir area was to be carried out by or through the State Government. With this modification to the scope of its proposal, essentially to exclude the consultation pre-requisite to carrying out socio-economic impact assessment, the UNIMAS team commenced environmental field studies for the project in August 1994.

After 3 months of field work with variable degrees of progress among the different sub-component participants, a project-wide interim EA report was assembled by UNIMAS and presented to the Malaysian DOE in November 1994. While the effort received some encouraging words with respect to progress made, the project developer was also reproached for submitting a voluminous report which presented, for many of the sub-components, raw data with little synthesis or analysis.

In December 1994, UNIMAS regrouped in response to pressure from its client, the project developer, to complete the assessments for the planned reservoir and dam, as these components were on the critical path of the project schedule. UNIMAS commissioned 2 environmental advisors to lead in the synthesis, analysis, and documentation of separate EIA reports for these components. Save for the integration of hydrological data, these reports were completed in draft form by mid-February, 1995, 7½ months after field study kick-off.

In total, four EA Reports (termed Environmental Impact Assessments, or EIAs, in Malaysia) were prepared for the Bakun Project, these being:

- 1) EIA - Reservoir Preparation
- 2) EIA - Dam and Ancillary Facilities
- 3) EIA Reports for Power Transmission System
 - Part 1: On-land Sarawak Sector
 - Part 2: Submarine Sector
 - Part 3: On-land Peninsular Sector
- 4) EIA - Bintulu-Bakun Access Road (by Sarawak Public Works)

These reports were organised to cover potential impacts and mitigation measures for the proposed activities. The detailed project description, detailed characterisation of the existing environment, public health surveys, and an environmental management plan and other elements were documented separately in a series of 11 appendices.

In March 1995, jurisdiction regarding the review of the Bakun EA was passed from the Malaysian Federal level to the State of Sarawak. The EA received approval in stages from early 1995 to late 1996.

3.0 Challenges in Environmental Assessment – Canada and Overseas

There are a number of common challenges facing EA practitioners in carrying out environmental assessments for energy projects, both in Canada and overseas (Biswas and Agarwala, 1992). Some relate to the management of EA requirements within the overall project effort, while others relate to addressing standard components of (or expectations from) an environmental assessment process for a project (World Bank, 1991).

Prominent among the EA management challenges are the inter-related aspects of:

1. EA timing within the project cycle,
2. Securing sufficient resources dedicated to the EA relative to the scale of the project, and
3. Institutional arrangements in place both to conduct the EA, and to have it reviewed in conjunction with the application for overall project approval.

There are also challenges for EA practitioners associated with key methodological elements of progressive EA practice. These EA elements have been developed and/or refined through experience in Canada over the past 25 years, and have become standardised in a sense in that provisions for their requirement exist within most provincial and federal EA legislation across Canada. Among these key methodological elements are requirements for:

4. Addressing project alternatives, and
5. Carrying out public consultation and socio-economic impact assessment, in order to address effects to a broad definition of environment (natural and social).

It is therefore useful to explore these five areas which are common to EA processes and practice in Canada for energy projects, but which can present significant complications and challenges beyond the Canadian experience when practised in a developing nation.

4.0 Challenges in the Field: Bakun Hydroelectric Project

4.1 EA Timing and Resources

Many Canadian practitioners of EA have encountered the schedule and budget “squeeze” on a project or programme within their experience. Whether they have been called upon to conduct a retro-EA for a project already under construction, for a project with an imminent or forecasted urgent need (AECL, 1997; Ontario Hydro, 1990), or one for which the initial funding levels required significant re-address due to overly optimistic initial estimates (Ontario, Consolidated Hearings Board, 1989; Risk, 1981).

Based on experience with the Bakun Hydroelectric Project, it can be argued that the window of “quality time” for carrying out EA studies within the project life-cycle in a developing nation tends to be narrower than in Canada. This can be traced to following root causes:

- severely limited budgets for EA, especially when considered in the context of project scale, and in terms of environmental baseline data availability;
- additional time spent justifying requirements for reference engineering and baseline environmental data;
- additional time gathering baseline environmental data, often in study areas where little, scattered or none exist;
- remoteness of the site location in the context of often limited transportation infrastructure;
- due to time spent providing capacity building services with cultural and language sensitivity in conjunction with performing the primary EA service: and,
- allowing for translation time where more than one language is required.

Construction of a dam of the size, scale, and remote location of the proposed Bakun Hydroelectric Project typically requires at least 8-10 years (Dixon et al., 1989). The Malaysian developer hoped to achieve units delivering power in 6 years (Ekran, 1995).

Pushed by these requirements, the EA schedule for this regional scale project was set to the following milestones:

EA Kick-off	July 1994
Interim Reports Due	initially end Oct 1994; later Oct 15

Final Reports Due	Apr 1995; later pulled forward to Jan 31 for Reservoir and Dam EAs
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As the project proceeded, the following information became available:

Environmental Field Studies	Some not carried out until Dec 1994
Engineering Reference Design	Some components not available until January 15; including site plan

The Bakun EA was carried out with allocated funds of less than 0.1% of the capital cost of the project. This despite site accessibility requiring a 2 hours by plane from Kuching, Sarawak's capital, to Sibu, the city at the Rajang R. delta, 12 hours upstream by river boat to reach the dam site, and a further 6 hours by small river boat to explore less than ¼ of the proposed reservoir area.

In the end, the Interim Reports were produced for October 1994 with generic engineering assumptions, and finals were delivered on time, i.e., all EA reports were finalised by late April 1995. Shortly thereafter, funding for environmental studies was curtailed.

Considering the scale of the Bakun Project, completion of the EA reports was achieved within a strict time and funding regimen. Nevertheless, upon conclusion of the environmental studies, the project developer was provided with materials that left it much better prepared to address environmental management during the full life cycle of the project.

4.2 Institutional Arrangements

In comparing EA institutional arrangements between Canada and a developing nation such as Malaysia, it is first necessary to consider the level of maturity of the EA process within the developing nation and the context for its implementation. Malaysia is in the process of devolving itself from dependence on financial aid from multi-lateral donor agencies, and therefore also from the covenants that bind receipt of donor assistance for development projects. These covenants from agencies such as the World Bank and the Canadian International Development Agency require significant project management monitoring and review requirements (World Bank, 1991). This devolution continues today as Malaysia is struggling to emerge from the regional economic crisis without relief packages from international lenders such as the International Monetary Fund.

This devolution has also lead Malaysia to place more reliance on their domestic human resources and intellectual property to provide peer and government review of development projects for decision making and approvals. While they are steadily and increasing their resource base of

expertise (especially at the Federal level) to provide review panels and knowledgeable government support staff, the pool of talent at the State of Sarawak level, for example, still requires further development of its “bench strength” to provide for a vigorous EIA review.

In Canada, the EA process has undergone 25 years of practice, and has built up and maintained a considerable human resource base and intellectual property capability. With a much more modest growth rate in the economy, this pool of human resources has been underused to the point where employment levels in the environment industry have declined for EA practitioners during periods of slower infrastructure development (CCHREI, 1996). EAs for large development projects receive considerable peer review, and vigorous scrutiny for approvals in most Canadian jurisdictions (Couch, 1988).

For Bakun, UNIMAS was a relatively young institution to face the formidable task of coordinating the EA for this massive project. Struggling early, the institution merely packaged up the sub-consultants reports with little integration or interpretation. While some experienced academics had good expertise and did a fairly effective job under the circumstances; others were obviously new to the pressures of the project cycle and had difficulty making the transition from pure research science to planning practice. Those heading up the address of some environmental sub-components tended to work in isolation from others, resulting in limited collaboration and little coordinated mapping.

In compiling the Final EA Reports, despite a significant lack of baseline environmental data for the reservoir catchment, the collective EA Team was managed more effectively by the UNIMAS EA Coordinator, who facilitated the team to see the advantages of integrating their contributions and to produce more meaningful maps, data synthesis, analysis, and recommendations. The effort put forth an EA that contributed beneficial information to the project developer, and provided a capacity building service to UNIMAS at the same time.

4.3 Project Alternatives

For the Bakun Project, the proponent was unable to present the need for the project within an Integrated Resource Plan (IRP) context, as none existed. In early 1995, Malaysia was still in negotiations with the World Bank for assistance in developing an IRP. Thus, the project could not be thoroughly discussed as part of a mix of alternative generation capacity to meet various demand scenarios to meet Malaysia’s growing energy requirements.

The issues of need and alternatives were covered off to some extent in the first chapter of the EA (Ekran 1995). Unfortunately, the first chapter of the EA was drafted by the project developer independently of the EA team, and discussed the technical, environmental, economic, and social feasibility of the project in qualitative generalities with limited connection to the issues discussed later in the documents. More discussion of the environmental implications of the “no project” scenario should have been added, particularly in reference to the future of the dam, reservoir, and catchment environment. Thus, project need and alternatives were covered off in qualitative terms that reflected government policy, but could have benefited from a more thorough analysis together with the environmental implications of other energy demand-supply options.

As this example illustrates, unless there are drivers in place such as World Bank loan covenants to push for prior public examination of energy policy (e.g., through Strategic or Regional scale EAs), there are often limitations imposed on the scope of discussion of project need and alternatives in a project EA.

4.4 Public Consultation and Socio-Economic Impact Assessment

Alongside professional expertise, public consultation is fundamental to determine the valued ecological and socio-economic components that dictate the scope and focus of the environmental assessment exercise.

There are significant challenges in carrying out public consultation in developing nations with cultures and political systems different from our own.

For the Bakun Project, the State of Sarawak saw it as their responsibility to address and manage the resettlement process for the 9500 indigenous Orang Ulu (literally “Upriver People”) living in what was to become the 700 km² reservoir area. This was understandable in that the State had a stewardship role to play for its citizens so directly affected by the project. Unfortunately, this arrangement also meant that efforts at public consultation and socio-economic studies by the project EA consultants were effectively restricted, and that the address of social issues became reliant on generic information from similar projects gained through such channels as the internet. The State planners did not fully realise the fundamental role social information plays in scoping and focussing the environmental assessment effort on the most relevant, and most valued, natural environmental components.

The situation constrained consideration of such key issues as:

- effects on downstream river transportation from lower discharge levels
- relative importance of river fish on the diet of local residents (approximately 80% of their protein intake)
- effects on other upstream and downstream residents (including those at the Rajang R. delta) who would not be resettled

Through persistence on the part of consultants to explain these implications, the State agreed to release some past studies and opened channels for some limited consultation. Through facilitation, the EA Coordinator also managed to use the high profile of the project to promote communication links between various government and academic agencies that were often working in isolation. These factors lead to some further consideration of the above key issues in the final EA reports, even if only to flag them as risks to the developer and to the State of Sarawak that social issues and compensation claims from the project may not have ended with a resettlement agreement.

5.0 Challenges in the Field: Other Experience

The challenges for practitioners experienced with EA work for the Bakun Project in Malaysia should not be considered uncommon, nor should the Bakun Project or Malaysia as a developing nation be centred out as an exceptionally difficult case example. Problems in these same areas have been experienced by EA practitioners in numerous developing countries and for numerous projects (Biswas and Agarwala, 1992; Dixon et al., 1989; World Bank, 1991).

6.0 Conclusions

Experience in Southeast Asia and elsewhere identifies a number of constraints which challenge EA practice in developing nations. These challenges include:

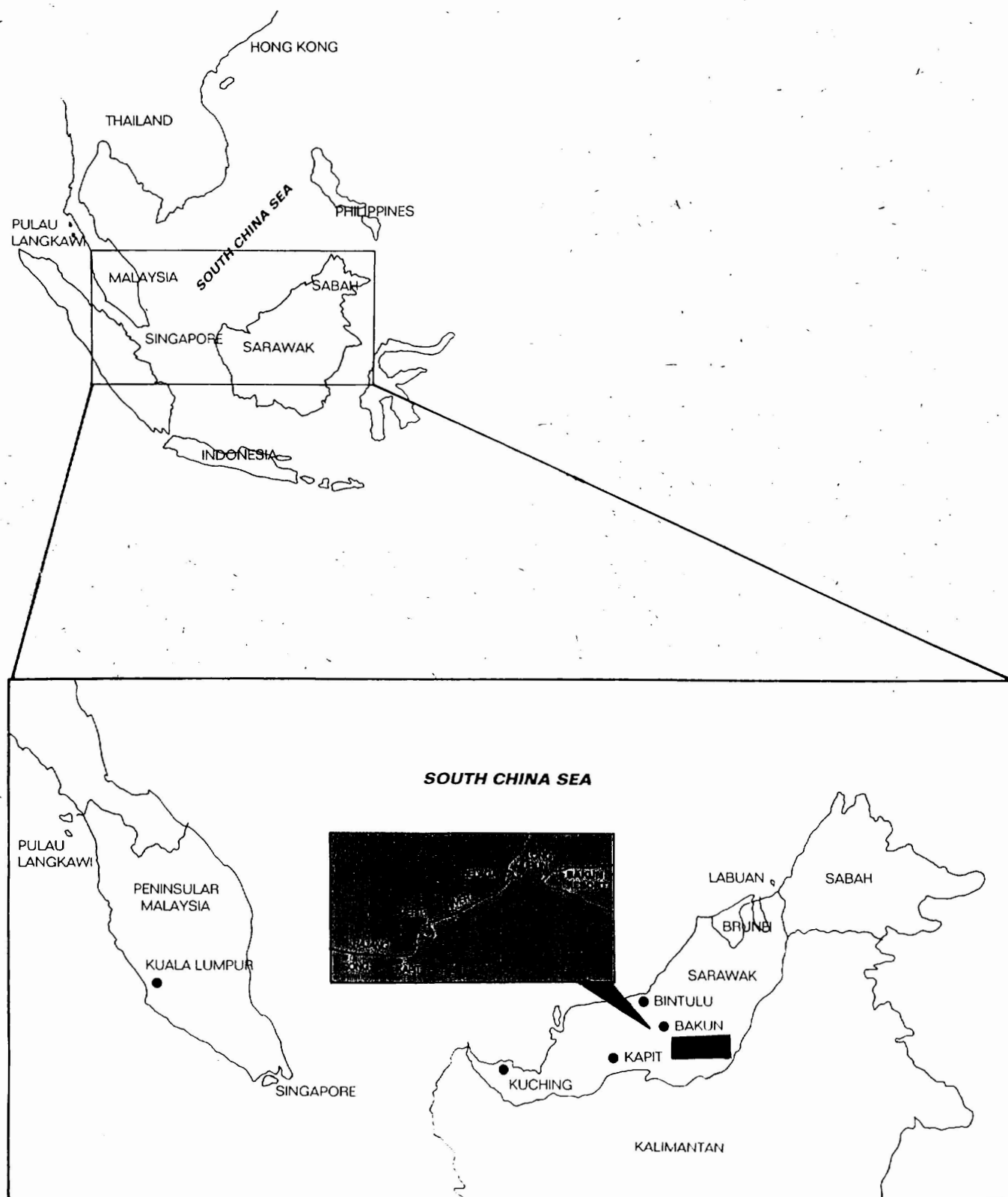
- narrow windows of “quality time” for carrying out EA studies within project life-cycles due to limited budgets, additional time spent justifying requirements and gathering reference engineering and baseline environmental data, time spent providing capacity building services, and other factors such as language barriers and limited access to the project location;
- limitations imposed on the scope of discussion of alternatives, especially when sectoral industrial policy is not identified early as part of the EA study terms of reference; and,
- carrying out public consultation in foreign nations with cultures and political systems different from our own. Public consultation is fundamental to determine the valued ecological and socio-economic environmental components that should dictate, alongside professional expertise, the scope and focus of the environmental assessment exercise.

However, despite these challenges, it was found that very useful EAs can be produced for energy projects in developing nations through:

- persistent coordination of effort;
- using the project to facilitate communication links between agencies within the developing nation;
- using advanced communication technologies to access external information resources; and through,
- promoting awareness of the utility of the EA for environmental management and due diligence during the full life cycle of the project.

Experience with performing environmental assessments overseas has highlighted the importance of clearly putting the environmental assessment in perspective for EA practitioners as well as for Canadian and international development observers.

Figure 1 Bakun Hydroelectric Project Location



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