

The Use of Environmental Impact Assessment and Strategic Environmental Assessment to Mainstream Climate Change into Development Projects, Programs, Plans, and Policies Globally and in Multilateral Agencies

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Abstract: *A growing trend around the world is to integrate climate change into environmental impact assessments (EIAs) and strategic environmental assessments (SEAs). Many nations and multilateral agencies recognize that climate change can not only impact on development projects but also some development projects (such as in the energy sector) can have an impact on greenhouse gas emissions, and therefore affect the global climate change phenomenon. Public pressure for integrating climate change into EIAs/SEAs is also becoming stronger, as the impacts of climate change on sea level rise, extreme climate events, heat waves etc. are already present and are only going to become worse throughout the lifetime of the average development project, which could be 30-50 years. The secondary effects on all sectors and on human wellbeing are also becoming clearer and need to be addressed in project design, with EIAs a particularly valuable tool for improving project design, and not just an administrative or regulatory requirement. Some good lessons from global practice should be more widely disseminated and assistance provided to developing countries.*

1. Introduction

Globally, environmental impact assessment (EIA) and strategic environmental assessment (SEA) started in the 1970's and 1980's, when climate change was not such a serious issue, although the greenhouse effect was certainly known. In recent years, however, climate change has become one of the most important environmental phenomena and therefore should be addressed as part of any environmental assessment. Climate change has two sides that need to be addressed: a development project can affect the environment, and the environment can affect the project. Development projects that emit greenhouse gases (GHGs) contribute to the overall burden on the global climate. At the same time, climate change is causing sea level rise, extreme climate events, increasing heat waves etc. which can affect infrastructure, agriculture, urban water supplies, and human health. Therefore, both aspects may need to be considered in an EIA or SEA, depending on the types of development being planned.

Accordingly, this paper attempts to document current best practice from around the world in grappling with this complex task. The aim is to show developing countries in Asia and the Pacific that there are already some useful practices adopted around the world that can be copied and adapted to conditions in the Asia-Pacific region.

2. Recent Developments from Other Regions and International Organizations

Table 1 shows the beginning of a global movement to integrate climate change into EIA as of 2010 (Modak and Ginoya 2013; OECD & AECOM 2011). Australia, Canada, and the Netherlands were pioneering countries in this respect, although the Netherlands preferred to address climate change through SEAs rather than EIAs.

In the view of EIA practitioners in Australia at that time, several barriers were recognized: (i) inadequate government policy and incentives to address climate change; (ii) lack of political and

agency will to address climate change, as other considerations (particularly economic) were seen as more important; (iii) EIA scoping did not address climate change; and (iv) a lack of expertise and appropriate EIA tools to deal with issue. Some of these constraints remain in several national jurisdictions today.

Generally, mitigation measures for reduction of greenhouse gas emissions can be built into the project design or environmental management plan, but adaptation needs may go beyond the project boundary, suggesting that adaptation may be better dealt with at the SEA or cumulative impact level rather than (or in addition to) project level EIAs (Modak and Ginoya 2013).

Table 1 - Progress in mainstreaming Climate Change in EIA (OECD & AECOM 2011)

	Level 1 Intension	Level 2 Guidance	Level 3 Implementation
Developed Countries	Spain	Australia	Australia
	European Union	Canada	Canada
	Canada	Netherlands	Netherlands
	United Kingdom	New Zealand	New Zealand
Developing Countries	Bangladesh	Grenada	
	Dominica	Kiribati	
	Kiribati	Trinidad and Tobago	
	Saint Lucia	Caribbean Community	
	Samoa		
	Solomon Islands		
	Caribbean Community		
Multilateral Organizations	Asian Development Bank		
	Inter-American Development Bank		
	The World Bank		

3.1 World Bank Group

The World Bank identified climate change as a key emerging issue to be considered in the update and review of its safeguard policies. During a community of practice meeting of the development partners in Manila in 2012, there was agreement that climate change should not be considered solely as a safeguard issue or as a specific policy compliance requirement. Climate change issues should be mainstreamed at different levels in projects. Also, social dimensions need to be considered in climate change adaptation projects to improve vulnerability reduction strategies and plans.

In its revised 2017 Environmental and Social Framework, the World Bank recognizes “that climate change is affecting the nature and location of projects, and that World Bank-financed projects should reduce their impact on the climate by choosing alternatives with lower carbon emissions. The World Bank works on climate change because it is a fundamental threat to development in our lifetime. The World Bank is committed to supporting its client countries to manage their economies, to decarbonize and invest in resilience, while ending poverty and boosting shared prosperity” (World Bank 2017).

At the project level, the World Bank addresses “project-level impacts on climate change and considers the impacts of climate change on the selection, siting, planning, design and

implementation and decommissioning of projects”. At the scoping stage, climate change is regarded as one of the environmental and social risks to be considered in the environmental and social impact assessment. In the Community Health and Safety standard, the World Bank recognizes that communities already subject to climate change impacts may experience acceleration or intensification of those impacts due to project activities. Infrastructure structural design will also incorporate climate change considerations where appropriate. In relation to ecosystem services, the Borrower will identify risks due to climate change and implement appropriate mitigation measures (World Bank 2017).

In relation to biodiversity, “the environmental and social assessment will consider direct, indirect and cumulative project-related impacts on habitats and the biodiversity they support. This assessment will consider threats to biodiversity, for example habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts” (World Bank 2017).

3.2 Asian Development Bank

The Asian Development Bank (ADB) requires all investment projects to be screened for climate change impacts to reduce the risks resulting from climate change. Through such screening at the earliest stages of project development, ADB is able to incorporate adaptation measures into all projects deemed to be at risk. The risk management framework consists of five steps:

- (i) climate risk screening at the concept development stage to identify projects that may be at medium or high risk;
- (ii) climate change risk and vulnerability assessment during preparation of projects at risk;
- (iii) technical and economic evaluation of adaptation options;
- (iv) identification of adaptation options in project design; and
- (v) monitoring and reporting on the level of risk and climate-proofing measures.

ADB uses a proprietary screening software called “AWARE for Projects” which uses climate projections from 16 models and various related databases. The software generates a risk rating from low to high, and provides guidance on potential impacts and possible adaptation measures. For infrastructure projects, these adaptive measures are referred to as “climate proofing”.

ADB’s Good Practice Sourcebook also refers to the impact of projects on climate change as follows. “The environmental assessment screening process should determine if the project falls in a sector that has the potential to emit one or more of the six GHGs listed in the Kyoto Protocol at the rate of 100,000 tCO₂e per year. Sectors that generate significant GHG emissions include energy, transport, heavy industry, agriculture, forestry and waste management. Projects with annual emissions equal to or above the threshold level should estimate: (i) the net GHG direct emissions from the facilities within the physical project boundary (i.e., emissions after all reduction measures are adopted); and (ii) the indirect emissions associated with the off-site production of power used by the project” (ADB 2012). For such projects, carbon offsetting is recommended.

In the most recent EIAs, for example for road projects, ADB has included the cost of adaptation measures, impacts on slope stability, improved drainage, and bioengineering in the EIA report and made sure these costs are included in the project design.

3.3 European Union

The European Commission recognizes that it is vital to integrate climate change and biodiversity into all plans, programs, and projects implemented in the European Union (European Commission 2013). In a 2009 White Paper, the European Commission committed to take account of climate change impacts when implementing the EIA and SEA directives and spatial planning policies (European Commission 2009). EIAs and SEAs are legally-required, systematic tools well suited to tackling climate change issues, and the EIA Directive was revised in 2012 to tackle this challenge.

Some of the key guidance messages from the Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment are as follows:

- Build climate change into screening and scoping stages of EIA;
- Bring together all relevant stakeholders into decision-making;
- Understand how climate change interacts with other issues covered by the EIA;
- Consider long term trends and avoid snapshot analyses;
- Consider the complex nature of climate change and the potential for cumulative impacts;
- Use tools like scenarios to deal with the inevitable uncertainty surrounding climate change;
- Base recommendations on the precautionary principle;
- Include extreme climate situations and potential big surprises;
- Use vulnerability assessments to assess the most resilient alternatives;
- Take an integrated approach to planning and assessment;
- Assess alternatives that will make a difference in climate change outcomes;
- Use ecosystem-based approaches and green infrastructure as part of project design; and
- Assess synergies and cumulative effects, which can be significant.

The revised EIA directive introduced clear references to “climate change” and “greenhouse gases” and provided a detailed description of climate change issues to be addressed as part of the screening criteria for Annex II projects — “impacts of the project on climate change (in terms of greenhouse gas emissions, including from land use, land-use change and forestry), contribution of the project to an improved resilience, and the impacts of climate change on the project”. It also specifies climate change issues to be addressed in the EIA report— “greenhouse gas emissions, including from land use, land-use change and forestry, mitigation potential, and impacts relevant to adaptation”.

3.4 Caribbean and Pacific Region

Reflecting the survival perspective of the small island developing states (SIDS), the Guide to the Integration of Climate Change Adaptation into the Environmental Impact Assessment Process was one of the first efforts to mainstream climate change into the EIA process (CARICOM 2004). The Guide does not try to establish a new or parallel EIA process but merely identifies a few simple steps to be taken under existing EIA processes and procedures. For any adverse impacts from climate change, the Guide proposes appropriate adaptation planning and management measures as part of the environmental management plan. The Guide is divided into 11 steps, which would be recognizable to any EIA practitioner:

- Define the project and alternatives
- Preliminary vulnerability assessment
- Initial screening
- Scoping

- Assessment and evaluation
- Environmental management plan
- Cost-benefit analysis
- Monitoring program
- Prepare final report
- Project appraisal
- Implementation and monitoring

Although a little dated now, the Guide also covers national integration efforts in 14 Caribbean countries and 4 Pacific Island countries, and has a separate chapter on cumulative impacts to be incorporated in the EIA report. An assessment of cumulative or synergistic effects “is a critical element when addressing climate change considerations in view of the diversity of impacts (e.g., changes in precipitation, temperature, frequency of extreme events, etc.) and the protracted time horizon that must be considered”.

In the Caribbean at that stage, only 3 countries had formal procedures for integrating climate change into EIA processes—Barbados, Grenada, and Trinidad and Tobago. In the South Pacific region, climate change is generally addressed in EIAs on a project by project basis, although that may have changed since 2004.

3.5 Canada

Canada recognizes that climate change may not only affect a project but also that projects may contribute to climate change through increased GHG emissions. On the latter, GHG management plans are required, while on the former impacts management plans are required as part of the environmental assessment (The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003). The Guidance to Practitioners document includes worksheets for both cases, sources of information, and a number of case studies. An important point is that incorporation of climate change into EIA helps to identify good practices to adapt to climate change, thus improving the long-term sustainability of projects.

Acknowledging that accurate prediction of climate change impacts on a specific project is still difficult, the combined use of climate models, historic data, local experience and traditional ecological knowledge is recommended. Impacts management plans could include (i) mitigation measures to reduce vulnerability; (ii) and adaptive management plan to adapt to future changes; and (iii) reduction of uncertainty by incorporating downscaled climate projections. Interestingly, the Guidance suggests that where there are only private risks involved, the private sector “may simply wish to assume the risks and not undertake mitigation or adaptation measures”.

3.6 Netherlands

Since 2008, EIA/SEA in the Netherlands has been found useful in examining the contribution of plans and projects to reduction in GHG emissions and the feasibility of responding to the impacts of climate change. On the mitigation front, environmental assessment for industrial projects, power stations, infrastructure, agriculture/horticulture projects, housing, waste management, groundwater abstraction, and airports, among others, must examine GHG emissions, energy efficiency, and contribution to national or local policy targets for GHG reduction. For adaptation, the National Commission on Environmental Assessment (NCEA) investigates if climate change adaptation should be a significant factor in deciding on the proposed project, depending on local climate impacts, characteristics of the project area, risks involved, and costs. The Netherlands

also pursues climate-proof spatial development through risk management, and exploiting natural ecosystem processes (Draaijers and van der Velden 2009). In principle, climate change should be dealt with as a separate section in the environmental assessment; explicitly in all SEAs and in most EIAs.

3.7 New Zealand

New Zealand recognizes that climate change needs to be mainstreamed into a variety of local government functions to ensure that development activities are “future-proofed” and sustainable (Ministry for the Environment 2008). The Guidance Manual prepared for the Ministry for the Environment:

- “provides projections of future climate change around New Zealand;
- compares these projections with present climate extremes and variations;
- identifies potential effects on local government functions and services;
- outlines methods for assessing the likely magnitude of such effects;
- explains how this information can be applied to assess the risk associated with various climate change impacts; and
- provides guidance on incorporating climate risk assessment into local government regulatory, assessment and planning processes”.

Interestingly, the approach builds on normal risk management procedures at the local government level rather than EIA. New Zealand established a new Environmental Protection Authority in 2011 and part of its mandate is in relation to climate change, through the Emissions Trading Scheme. However, there does not appear to be significant attention paid to integration of climate change into EIA procedures, despite a few examples in relation to marine development in the exclusive economic zone of New Zealand.

3.8 Australia

The Commonwealth Government of Australia addresses matters of national importance but does not explicitly require attention to climate change in EIAs at that level, and in many respects climate change has become a political issue rather than a technical one. Generally, climate change is addressed in EIAs under the control of some States and Territories. In part, this was brought about by court challenges rather than policy decisions (AECOM u/d). For example, a housing development near Sydney was initially approved then challenged in the court. While the initial EIA did include specialist flood studies, the court questioned whether changing weather patterns would lead to increased flooding and required a further assessment of the risk-weighted consequences of proceeding. With global heritage like the Great Barrier Reef threatened by climate change, the State of Queensland explicitly requires a Climate Change Impact Assessment and introduces the hierarchy of “avoid-adapt-defend-retreat” to fend off concerns about maladaptation.

5. Conclusions

At the level of development plans, programs, and policies, climate change should be fully integrated into SEAs as a matter of course, with appropriate mitigation measures designed, funded, and implemented through specific projects. Hazard mapping, cumulative impact assessment, and vulnerability assessment should become a normal part of the SEA tool kit. Capacity building in the use of these tools and updated guidance manuals are needed for

government officials and EIA/SEA practitioners, as this kind of training has only recently been added at the university level.

Screening of projects for potential impacts of climate change and revisions to project design standards (including engineering standards) will be essential, especially for infrastructure projects such as roads or railways, as the past climate conditions are no longer reliable for future conditions. Where EIA procedures require the project proponent to examine possible alternatives, the EIA consultants should always be required to look for the low carbon alternative or the climate proof alternative that will contribute to longer term sustainable development. Integration of climate change into EIA is totally in line with the original aim of all EIAs, which is to avoid environmental damage, improve project design, and ensure that projects contribute to sustainable development.

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