

Challenges to Integrate Climate Change Considerations in Environmental Impact Assessment¹

1 Introduction

Climate change is one of the key challenges facing sustainable development (IPCC 2007). In spite of this well established fact, planners and regulators are not addressing the impacts of climate change adequately in the future plans. This is not just the case with the developing countries but with the developed countries as well.

One of the strategies to reflect concerns on Climate Change (CC) is to integrate CC considerations in Environmental Impact Assessment (EIA). There is a growing interest in the EIA community regarding such mainstreaming. Alberti and Susskind (1996) argue that together with Cumulative Impact Assessment, EIA is a crucial tool for setting and achieving a project's climate change and other sustainability targets (Jeonghwa and Theophilus 2012).

2 Climate change and EIA

The level of progress in integrating CC considerations in EIA varies considerably among countries (Agrawala, et al. 2010). Countries like Netherlands, Canada and Australia have been the pioneers in implementing incorporation of CC in EIA. While Netherlands includes climate change through a Strategic Environmental Assessment (SEA), Canada and Australia have taken the route towards CC integration through project level EIAs. The European Commission, in its directive on the assessment of the effects of certain public and private projects on the environment, aims to reflect CC-related concerns (European Commission 2012). Table 1 provides a status on adoption of CC considerations into EIAs across developed and developing countries as well as by multilateral organizations.

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		

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Although CC related concerns and understanding are growing, incorporation of CC in the EIA process has not seen an acceptance as expected. Project developers in countries like Canada, a pioneer in this area, believe that not much climate related information is available to analyze the impacts of climate change on the projects. Besides, data availability and expertise on CC modeling is still an issue. Box - 1 presents a case study where CC has been factored in the EIA process influencing the project design. Box 2 provides analyses of barriers in the Australian CC-EIA system.

Box 1 Case Study: Incorporation of climate change in EIA

The East Lakes electrical infrastructure project is located on the banks of Lake Burley Griffin next to the Jerrabomberra wetlands in the ACT Government in Australia. It triggered an EIA and, as part of the scoping requirement, a climate change risk assessment. Flood studies in the area indicate that the substation site (E4) is within a probable maximum precipitation design flood.

Assuming use of natural contours, climate change modeling suggested that by 2030 there will be a moderate risk of E4 being flooded, due to an increase in extreme daily rainfall events, and the intensity and frequency of storms. This could result in a less reliable electricity supply without mitigation and could increase the costs associated with repairs and infrastructure replacement. The likely risk under a 2070 low scenario is also moderate, but in a 2070 high scenario, climate modeling showed a high risk of flooding.

To ensure integrity of the network during peak flood events the EIA recommends that all electrical equipment in E4 should be positioned approximately 2 m above the probable maximum flood level to avoid potential future flood risks. The decline in stability due to ground movements and impact on foundation was considered low. The effects of climate change also included extended dry periods, resulting in increased dust build-up and potential transformer failures. Hence, the design of structures included a significant safety margin to minimize the risk of catastrophic failure and operational procedures include maintenance and reacting to spills and other major failure events. An additional effect was increased load to the system due to increased temperatures and more frequent heat waves requiring air conditioners and other power demands. With these considerations, the project at East Lake will assist in servicing the increased demand with sustained reliability

Source: Agrawala et al 2010.

Box 2- Barriers on CC Integration in EIA : A Survey of Australian CC-EIA

International Association of Impact Assessment (IAIA) surveyed the Australian CC-EIA system from the point of view of EIA practitioners. In all, 63 respondents were drawn across the country. It was found that majority practitioners believed that CC is highly relevant in EIA and Strategic Environmental Assessment (SEA). In addition, they suggest that project EIAs cannot take lead in incorporating CC EIA. CC considerations must start from SEAs.

The major barriers to project EIA being able to address climate change were ranked as follows:

1. Lack of government policy and incentives to address CC
2. Lack of political and agency will to address climate change and other consideration (economic) seen as more important
3. EIA scoping does not address CC i.e. EIAs have a limited scope
4. Lack of expertise and lack appropriate EIA tools to deal with issue

3 Importance of using Regional and Strategic EIA in Integrating CC

CC considerations in EIA typically result into mitigation and adaptation plans. The adaptation plans need to be developed at regional level, often beyond the boundaries of an individual project. For designing and implementing adaptation related plans, a simultaneous consideration to multiple projects is required to assess the cumulative impacts over the region. The entry point for developing adaptation plan is thus at strategic level where tools such as Regional EIA (REIA), SEA and Cumulative Impact Assessment (CIA) need to be used.

The mitigation plans on the other hand are generally project-limited and influence the project design and operations. Here aspects such as energy mix, water use and conservation, afforestation and erosion control need to be examined. Many of these aspects get addressed in the preparation of Environmental Management Plan (EMP).

To address abnormal and emergent situations, the EMPs need to be accompanied by the Disaster Management Plan (DMP). Once CC considerations are included, adaptation and mitigation elements get factored and the DMP assumes a form of a Disaster Risk Reduction Plan (DRRP). This DRRP needs to address both onsite and offsite risks. Management of onsite risks become a part of the Project EIA while the management of offsite risks need to be integrated with regional DRRP. Both EMP and DRRP need to abide by the framework of the SEA with clear institutional and cost sharing arrangements. Again, DRRP needs to be "synchronized" with the adaptation related plans at the regional level - especially on matters related to policy, plans and supporting commonly shared infrastructure. Figure 1 shows the relationships between SEA/REA, Project level EIA, EMP and DRRP in the context of CC integration.

Many developing countries do not have processes and tools such as REA, SEA and CIA as a mandatory part of the environmental clearance process. To integrate CC into the EIA, application of these tools is necessary. Public consultations should be used as an important milestone to link the SEA, REA and Project level EIAs.

EIAs are generally processed by State and Central level environmental authorities. Separate departments/ministries operate for management of disaster related risks. Often there are no linkages occur between these institutions. SEA with a focus on CC can be utilized to ensure mainstreaming of CC in project and regional EIAs and more critically to ensure coordination between key institutions and the project sponsor.

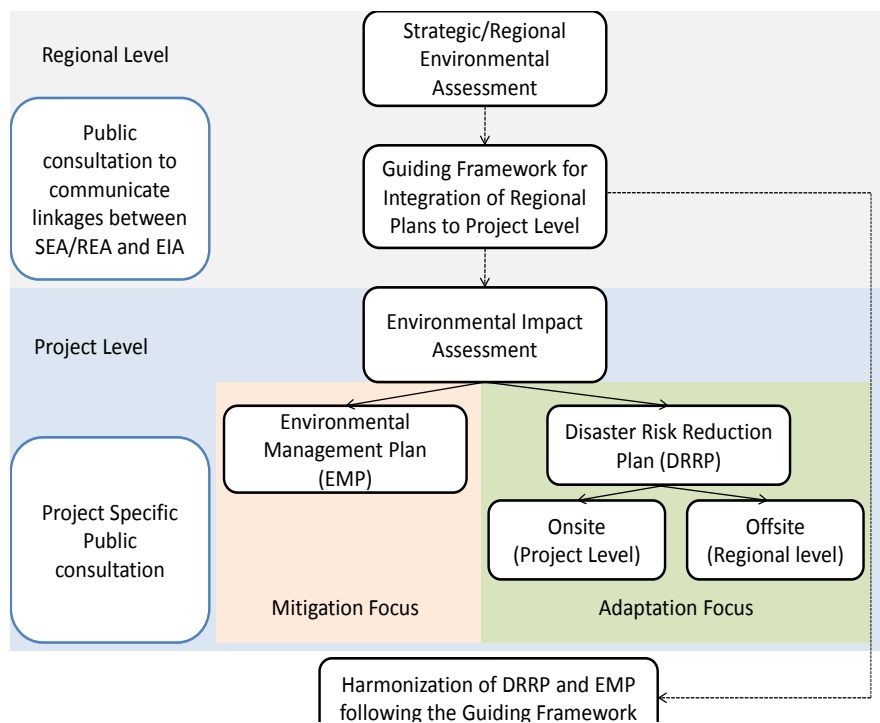


Figure 1: Integration of CC consideration in EIA

4 Sharing of responsibilities

Key stakeholders in the CC integration will be National/Regional Planning agencies, Environmental and Disaster Management Agencies and the Project Proponent. Table 2 lists roles and responsibilities of key stakeholder institutions in the conduct of SEA, Regional EIA and Project EIAs.

Table 4 – Roles and Responsibilities of Key Stakeholder Institutions

Activity	Planning Institutions engaged with Development and Development Controls	Environmental and allied regulators involved in Environmental Clearance	Project Proponent
SEA/REIA			
Baseline data of climate parameters like rainfall, temperature, Hydrological maps, infrastructure mapping, natural resource maps	✓	✓	
Future projections of climate at regional level	✓	✓	
Probable CC related impacts/risks at regional level	✓	✓	
Strategic/Regional Environmental assessment incorporating CC	✓		
Consultation with authorities and stakeholders	✓	✓	✓
Development of Guiding Framework and	✓	✓	

Activity	Planning Institutions engaged with Development and Development Controls	Environmental and allied regulators involved in Environmental Clearance	Project Proponent
Operational Principles for Integration of adaptation and mitigation in the development plans and policies			
Prepare response mechanism plans for disaster risk reduction at regional level	✓	✓	
Monitoring effectiveness of the plan in terms of mitigation and adaptation	✓	✓	
Project EIA			
Impact of climate change on project/programme			✓
Mitigation measures			✓
EMP			✓
DRRP	✓		
EMP, DRRP Integration with outcomes of REA/SEA	✓	✓	✓
Stakeholder consultation	✓	✓	✓

Given the need to have a close cooperation between planning and environmental regulatory agencies, it may be worth to establish a CC cell that does the required coordination. This CC cell may be supported by a CC related research organization that has required databases and expertise on CC related modelling. This concept is shown in Figure 2.

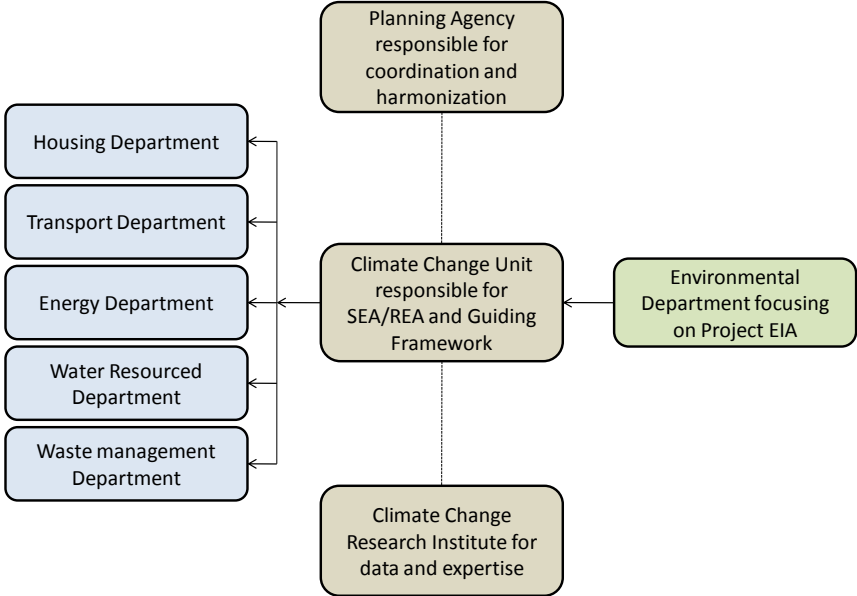


Figure 2: Institutional Arrangements for Mainstreaming CC considerations in EIA

5 Conclusions

It is important that CC considerations are addressed in the project EIAs. REA/SEA assumes an important role to ensure harmonization between Project level EMP and DRRP with the CC adaptation plans at the regional level. Institutional coordination and cost sharing become key considerations in the implementation of the CC related recommendations. Involvement of the stakeholders is necessary to appreciate the concerns of the CC, especially its economic, social and environmental implications. Capacity building of the planners, regulators and professionals is required. Finally, pilots should be implemented to demonstrate how CC could be mainstreamed.

6 Bibliography

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