ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Incorporating Climate Change Impacts and Adaptation in Environmental Impact Assessments (EIA)

Opportunities and Challenges

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Outline

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1. Why integrate climate change impacts and adaptation in EIA?

- There is a growing need for analysis and guidance on how to integrate adaptation to climate change into the design and implementation of projects.

- EIA could be an efficient tool to "climate proof projects" because…
  - EIA is a well-established environmental decision-making tool in many countries, bilateral and multilateral agencies
  - Incorporating climate change into existing modalities such as EIA instead of stand alone measures can enhance efficiency in using financial and human resources

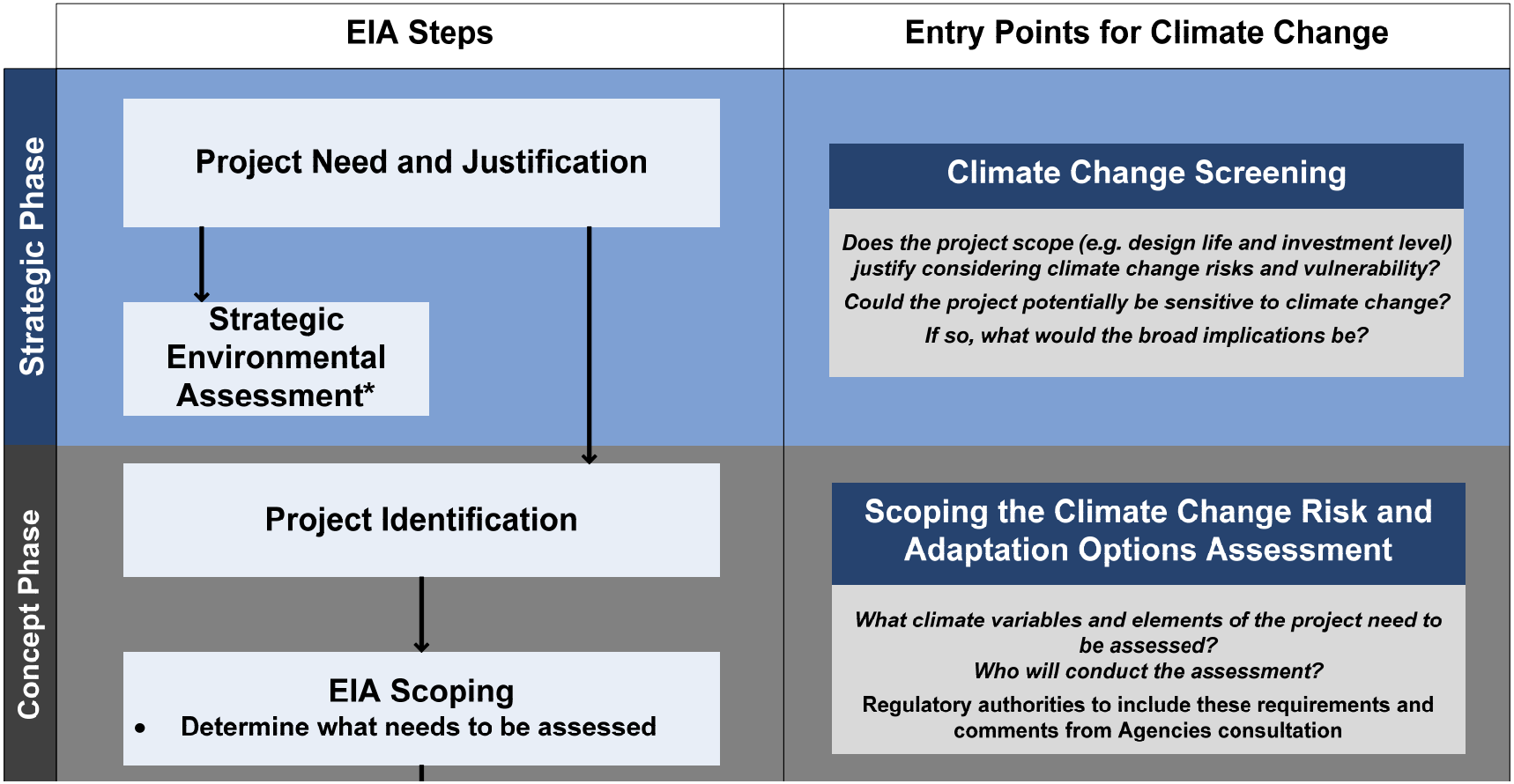
- … but EIA is usually designed to identify the impacts of a project on the environment and not the impacts of environmental change on the project.

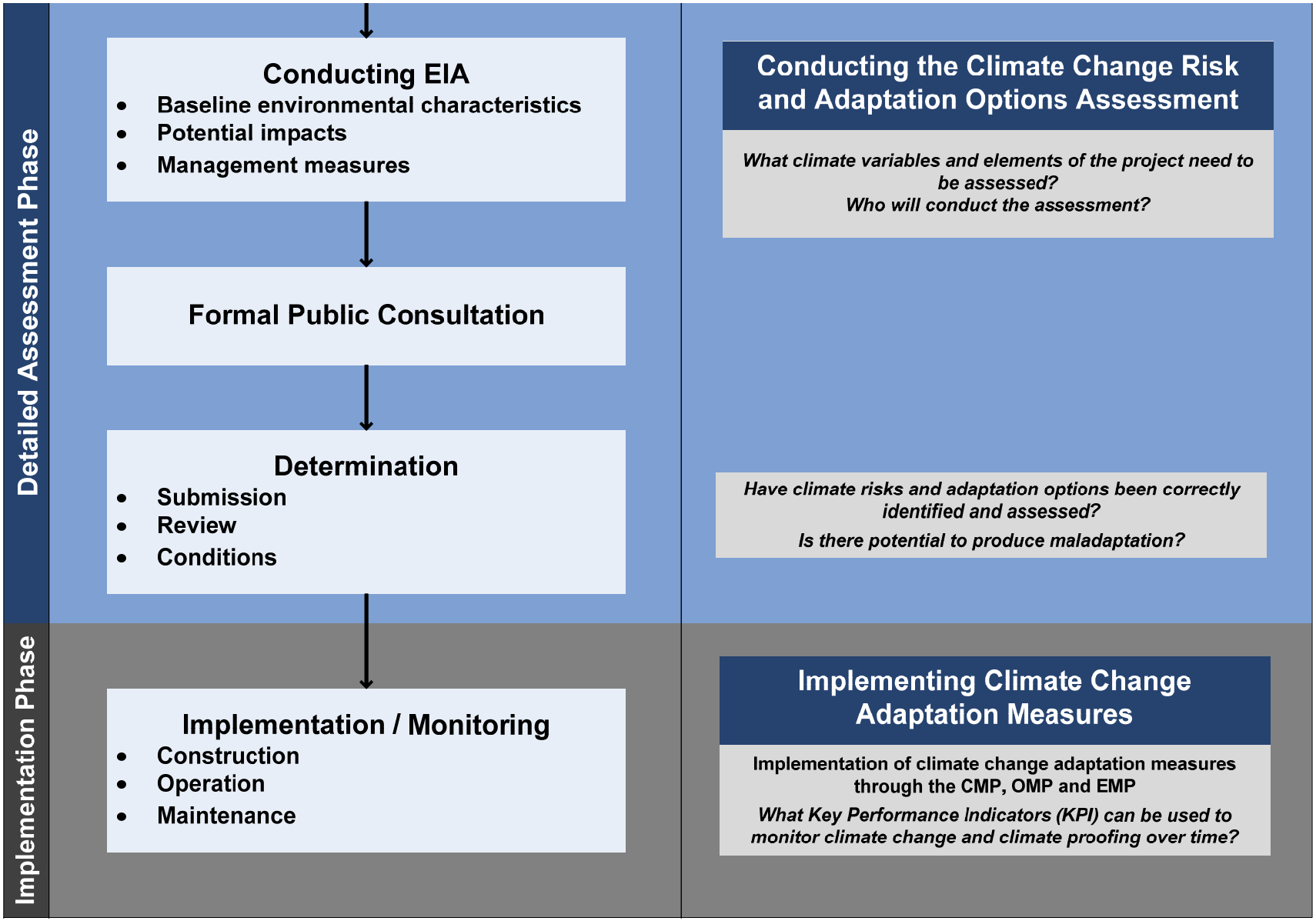
2. EIA: Steps and Potential Entry Points for Adaptation

"EIA is the process of identifying predicting, evaluating, and mitigating the biophysical, social and other relevant effects of development proposals prior to major decisions being taken and commitments made." (IAIA, 1999)

- To ensure the incorporation of environmental considerations in development decision making
- To anticipate and avoid effects of development proposals on the environment
- To protect the capacity of natural systems
- To promote sustainable development and optimization of resources

2.1 Entry points for climate change adaptation




Detailed Assessment Phase
Implementation Phase
Conducting EIA
Baseline environmental characteristics
Potential impacts
Management measures
Formal Public Consultation
Determination
Submission
Review
Conditions
Implementation / Monitoring
Construction
Operation
Maintenance
Conducting the Climate Change Risk and Adaptation Options Assessment
What climate variables and elements of the project need to be assessed?
Who will conduct the assessment?
Have climate risks and adaptation options been correctly identified and assessed?
Is there potential to produce maladaptation?
Implementing Climate Change Adaptation Measures
Implementation of climate change adaptation measures through the CMP, OMP and EMP
What Key Performance Indicators (KPI) can be used to monitor climate change and climate proofing over time?

3. Stocktaking of progress

The level of progress in integrating climate change considerations in EIA varies considerably among countries:

Level 1: Intention

- Have countries expressed intention to use EIA to climate proof?
- Is this intention integrated in national planning documents?

Level 2: Operational Guidance

- Has the regulatory framework been modified to integrate climate change in the EIA process?
- Are specific operational guidelines in place?

Level 3: Implementation

- Is EIA providing guidance to climate proof projects?
- Are there successful cases where projects have implemented changes to address climate change impacts?

4. Three levels of integration
Country examples

Level 1: Intention

- Canadian requirements, EC guidelines, Australian EPBC Act,...
- SIDS National Communications to UNFCCC and NAPAs
- CDB and CARICOM recommendations

Level 2: Operational Guidance

- Canadian Environmental Assessment Agency guidance
- CARICOM operational guidance for EIA practitioners
- Netherlands Commission for Environmental Assessment

Level 3: Implementation

- Netherlands: Room for Rivers
- Canada: Cascade Power Park, Confederation Bridge, Diavik Mines,...
- Australia: Murrumbidgee to Googong Water Transfer, Armidale Landfill, Mulligan Flats Road,...

4.1 Example Level 2: CARICOM and CDB recommendations for Jamaica (2004)

Revision of definition of EIA

- to also address impacts of the environment (i.e. natural hazards and climate change) on the project

Provision of clear criteria to screen and scope environmental impacts

- to ensure identification of the significant natural hazard impacts on the proposed project or activity

Provision of clear EIA Guidelines for the preparations of EIA report

- to ensure that the EIA process addresses natural hazard impacts

Provision of clear criteria governing EIA experts

4.2 Example Level 3: Climate change considerations in EIA of projects in Canada

Project	Climate Change Considerations
Cascade Power Park	Changes in hydroelectric regime potentially affecting viability of operations and fisheries.
Confederation Bridge	Integrity of bridge structure over design life of project due to a rise of 1m in sea level, ice-out and inundation of low-lying areas near the bridge.
Diavik Mines	Permafrost, integrity and design of facilities in light of changes in air temperature, snow cover and precipitation regime.
Dredging of St. Lawrence River	Maintenance of a channel with a minimum depth of 11.3 m below low-water line which may be affected by reductions of water levels and flows in St. Lawrence River arising from lower precipitation and lower Great Lakes levels.
Little Bow Reservoir	Water supply for use in irrigation, municipal water supply and water based recreation as affected by changes to precipitation regime and demand from use of evapotranspiration.
Decommissioning of Quirke and Panel Mines	Permanent containment of tailing ponds requiring adequate supply as affected by extremes in precipitation, both excessive amounts giving rise to floods and insufficient amounts giving rise to droughts.

Source: Adapted from Lee (2001)

4.2 Example Level 3: Climate change considerations in EIA of projects in New South Wales (NSW) and Australian Capital Territory (ACT)

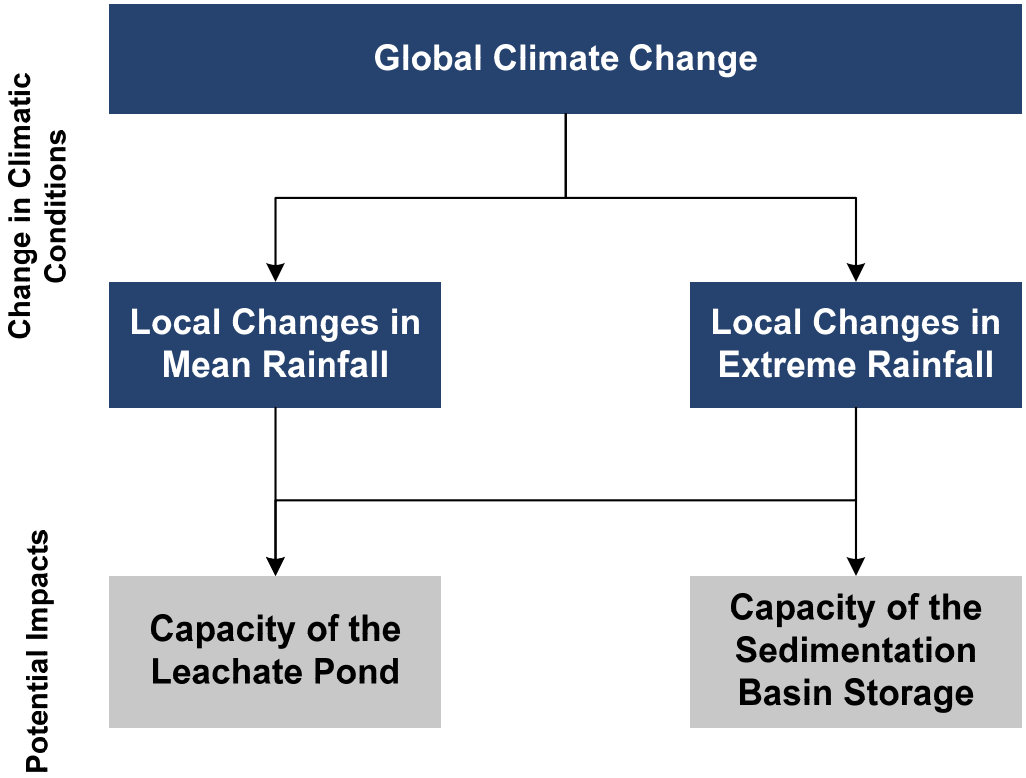
Project name	Project type	State/Territory
East Lakes 132kV Substation, Sub transmission Line and Cable Routes	Electricity transmission	ACT
Mulligan Flats Road Upgrade	Road	ACT
Mount Franklin Road, Cotter Hut Road and Smokers Trail, Namadgi National Park	Road	ACT
Murrumbidgee to Googong Water Transfer	Water pipeline	ACT/NSW
Clarie Hermes Drive Extension	Road	ACT
Kings Highway Southern Deviation	Road	ACT
Armidale Landfill	Landfill	NSW
South West Rocks Aquaculture	Aquaculture	NSW
Boollwarroo Parade, Shell Cove – Shellharbour / Shell Cove Boat Harbour Precinct, Shell Cove	Residential Development	NSW
Barangaroo (formerly East Darling Harbour) - Sydney	Residential Development	NSW
DPI Land at Bloomfield – Orange	Residential and Retail Space Development	NSW

Source: ACTPLA (2010), NSW Department of Planning (2010)

5. Detailed Example: Armidale Landfill, Australia

STEP 1: Screening for climate sensitivity

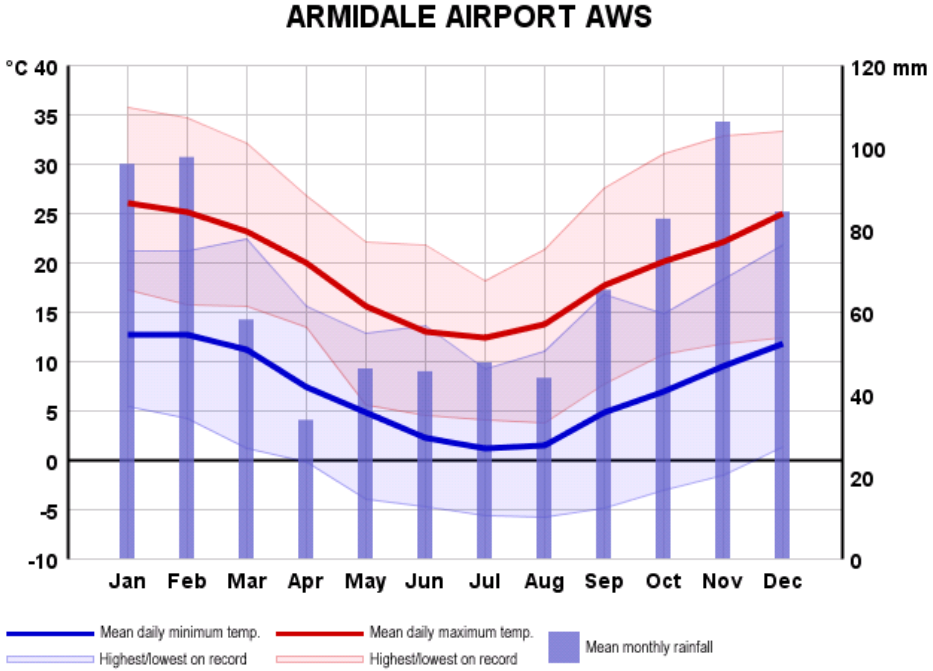
- Identify all project aspects based on project brief
- Identify climate-sensitive project aspects



5. Detailed Example: Armidale Landfill, Australia

STEP 2: Sourcing climate observations and projections

- Characterise average climate in vicinity of project and observe recent data trends
- Liaise with CSRIO to obtain climate projections
- Review published State guidelines and policies for considered area



Source: Australian Bureau of Meteorology (2010)

5. Detailed Example: Armidale Landfill, Australia

STEP 3: Prepare climate change risk and adaptation options assessment

- Use risk framework and climate data to determine the likelihood and consequences of climate risks to the project
- Validate draft findings with key designers and project manager
- Discuss risk reduction measures, buffer zone, design flexibility and how they can be augmented

Likelihood	Consequences				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (5)	M (5)	M (10)	H (15)	E (20)	E (25)
Likely (4)	L (4)	M (8)	H (12)	H (16)	E (20)
Possible (3)	L (3)	M (6)	M (9)	H (12)	H (15)
Unlikely (2)	L (2)	L (4)	M (6)	M (8)	M (10)
Rare (1)	L (1)	L (2)	L (3)	L (4)	M (5)

5. Detailed Example: Armidale Landfill, Australia

E = >20: Extreme risks demand urgent attention at the most senior level and cannot be simply accepted as a part of routine operations without executive sanction.

H = >12: High risks are the most severe that can be accepted as a part of routine operations without executive sanction but they will be the responsibility of the most senior operational management and reported upon at the executive level.

M = >5: Medium risks can be expected to form part of routine operations but they will be explicitly assigned to relevant managers for action, maintained under review and reported upon at senior management level.

L = <5: Low risks will be maintained under review but it is expected that existing controls will be sufficient and no further action will be required to treat them unless they become more severe.

Risk rating using the matrix

Risk Scenario	Climate Variable	Risk Description and Flow-on Effects	Risk Rating 2030	Risk Rating 2070
The leachate pond is not designed to cope with future rainfall patterns	Mean rainfall and extreme rainfall	An increase in rainfall intensity could potentially result in overtopping of the leachate pond due to a higher volume of rainfall.	Medium	Medium

5. Detailed Example: Armidale Landfill, Australia

Follow-up

- Seasonal rainfall projections for 2030 and 2070 are currently being used as inputs to a water balance model to evaluate potential changes in the design of the leachate pond.

- Key challenge is uncertainty in rainfall projections, which is proving a key challenge for inputs to the water balance model and eventually to any changes in the design of the leachate pond.

- Also, despite requirements by NSW regulatory authorities to also consider changes in runoff, it was not possible to do so due to lack of relevant local data.

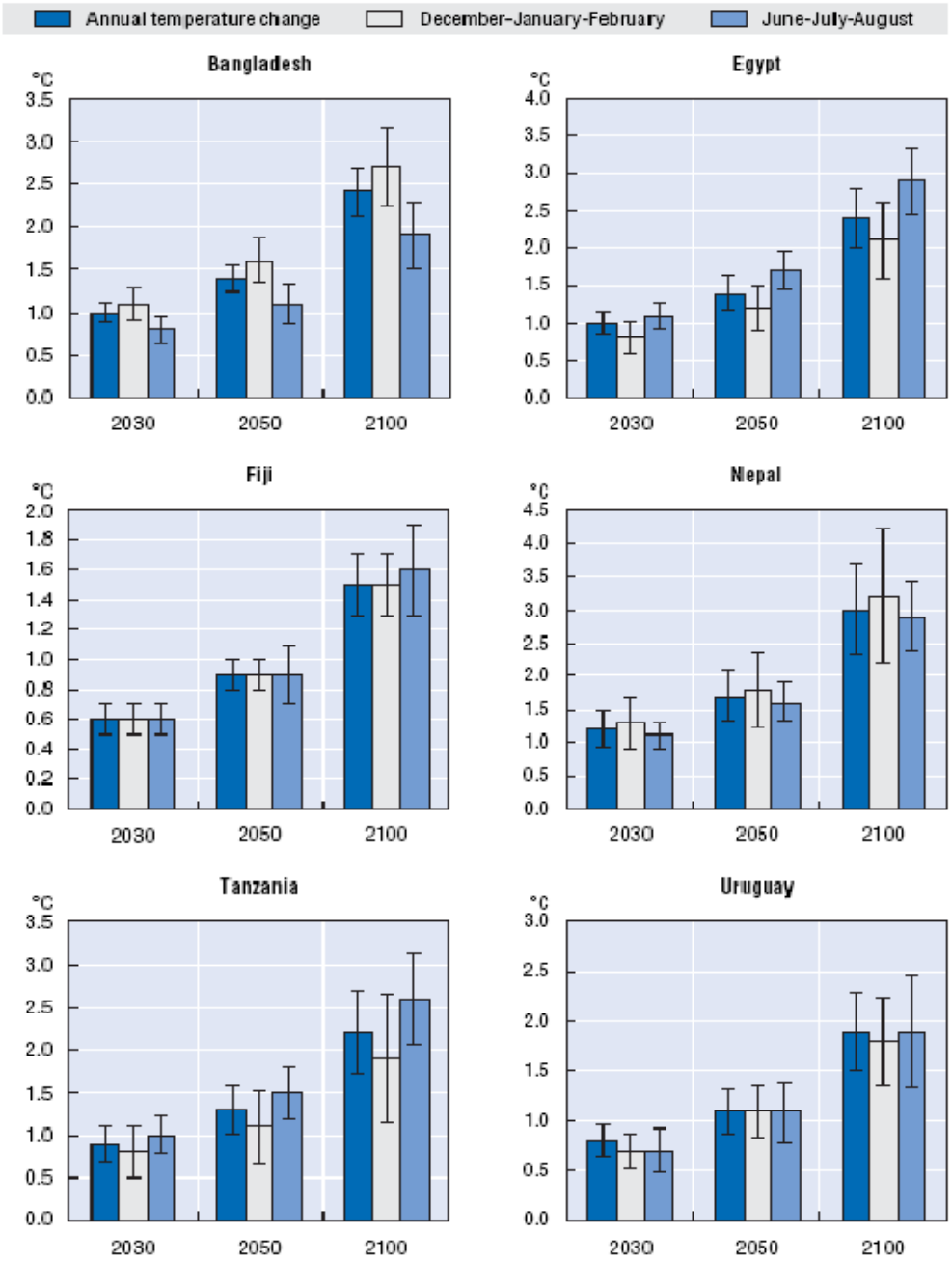
6. Incorporating climate change impacts and adaptation in EIA: Intention versus Implementation

Level 1 – Intention	Level 2 – Guidance	Level 3 – Implementaion
Developed Countries	**Developed Countries**	**Developed Countries**
Canada	Australia	Australia
Spain	Canada	Canada
European Union	Netherlands	Netherlands
Developing Countries	**Developing Countries**	
Bangladesh	Grenada	
Dominica	Kiribati	
Kiribati	Trinidad and Tobago	
Saint Lucia	Caribbean Community	
Samoa		
Solomon Islands		
Caribbean Community		
Multilateral Organisations		
Asian Development Bank		
Inter-American Development Bank		
World Bank		

There is a strong gap between the desire to incorporate climate change impact considerations in EIA and putting it in practice.

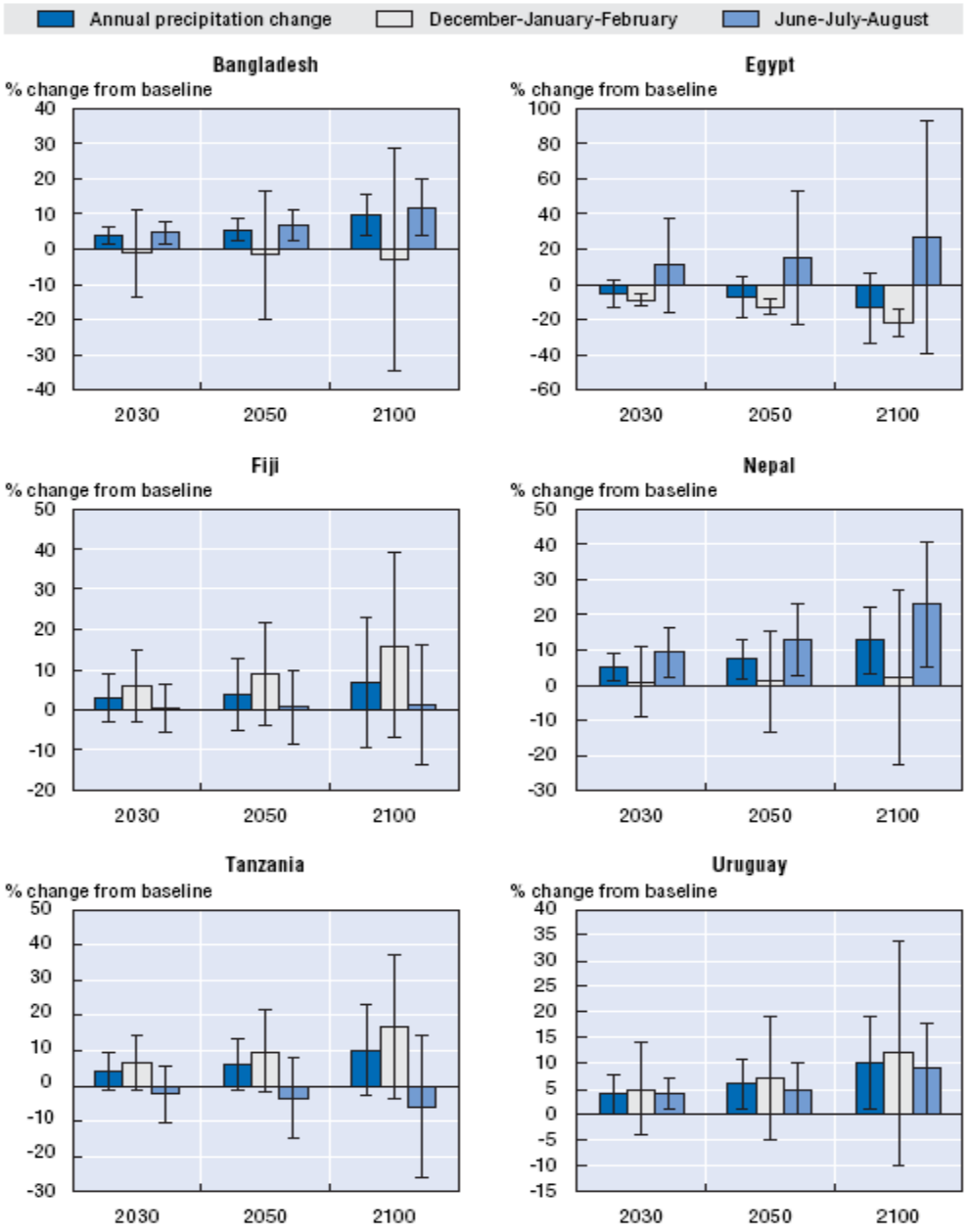
7. A cautionary note on uncertainty in climate projections

Figure 2.3. **Projections for country-average temperature increase**



OECD 2005

Figure 2.4. **Projections for percentage change in country-averaged precipitation**



8. Concluding remarks

- There is ample scope for employing EIA as a vehicle to enhance resilience of projects to the impacts of climate change. A number of entry points can be identified to accomplish this within the EIA cycle.

- Several national and sub-national authorities, as well as development agencies, have made progress in this direction. However, there is much more progress at the level of *intentions* than actual *implementation*.

- In terms of actual implementation, examples of project EIAs that incorporate consideration of climate change impacts could primarily be found only in Australia, Canada and Netherlands.

- In several projects the EIA only relied on historical climate. Climate change impact assessments have also at times been applied inconsistently. Systematic consideration of climate change requires availability of spatially specific scenarios of climate change.

8. Concluding remarks

- Any use of climate change scenarios in the EIA should take adequate account of the associated uncertainties in such projections. There may be a risk of unnecessary or even counterproductive investments in altering project design if these uncertainties are not adequately considered.

- There is also a concomitant need to make substantial and long-term investments in the provision of climate change information, as well as establishing good communication mechanisms between the scientific community and practitioners so that climate change information could be judiciously incorporated within EIA.

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