DAC NETWORK ON ENVIRONMENT
AND DEVELOPMENT CO-OPERATION (ENVIRONET)

STRATEGIC ENVIRONMENTAL ASSESSMENT AND ADAPTATION TO CLIMATE CHANGE

Endorsed by members of the DAC Network on Environment and Development Co-operation (ENVIRONET) at their 8th Meeting on 30 October 2008

OECD

Acknowledgements

This Advisory Note was prepared by Nathalie Risse (Consultant) and Nick Brooks (Consultant) in close collaboration with a Core Working Group led by UNDP and CIDA: Linda Ghanime (UNDP), Peter Croal (CIDA), Jon Hobbs and Yvan Biot (DFID), Barry Dalal-Clayton (IIED), Remi Paris (OECD DAC Secretariat), and Mihoko Kumamoto, Xianfu Lu, Henrieta Martonakova and Holly Mergler (UNDP). Comments and inputs were provided by the OECD DAC ENVIRONET SEA Task Team. Technical Secretariat Services were provided by the International Institute for Environment and Development.

Final editing was undertaken by: Jon Hobbs (DFID) and Linda Ghanime (UNDP) [Co-Chairs of the OECD DAC SEA Task Team]; Remi Paris, Tamara Levine and Anna Brüderle (OECD Secretariat) and Barry Dalal-Clayton (IIED) [Technical Secretariat to the SEA Task Team].

Table of contents

Tables

Boxes

Preface

This is one in a series of Advisory Notes that supplement the *OECD/DAC Good Practice Guidance on Strategic Environmental Assessment* (SEA) (OECD/DAC 2006). The Guidance provides a broad framework, steps and principles of SEA application across the full range of policies, plans and programmes (PPP) (summarised in Annex 1). However, a need was recognised for more detailed advice on:

a) a range of key emerging issues that may need to be more explicitly incorporated within an SEA; or
b) special or challenging circumstances in which SEA may be applied.

The Advisory Notes are not intended to provide exhaustive, in-depth guidance but rather supplementary advice and links to resources where more specialised information can be found.

Therefore, these Advisory Notes fall into one or more of the following categories.

1. Applying SEA in particular situations or circumstances that will require unique sensitivity and awareness (*e.g.* post conflict environments);

2. Providing further perspective, information and guidance on emerging issues that may need to be more adequately integrated into an SEA. (*e.g.* climate risk or ecosystem services);

3. Undertaking an SEA that focuses specifically on a key emerging issue or policy area that was not sufficiently addressed when the DAC SEA Guidance was prepared (*e.g.* biofuel development strategies, post-conflict reconstruction plans).

The target audience of the Advisory Notes are SEA practitioners (to help strengthen the quality of SEA) and specialists in the specific issues or circumstances under consideration (to introduce them to the added value of SEA to their work).

This Advisory Note is intended to (i) illustrate how SEA may provide a framework for integrating considerations of climate change risks and opportunities into strategic planning, and to (ii) guide planners, policy makers and sector specialists working in the preparation of PPPs and those already familiar with SEA in the inclusion of climate change considerations into PPPs.

STRATEGIC ENVIRONMENTAL ASSESSMENT AND ADAPTATION TO CLIMATE CHANGE

I. Introduction

As a result of the work of the Intergovernmental Panel on Climate Change (IPCC), there is widespread recognition that human activities are changing the global climate system, and that every part of the globe will be affected by the impacts of climate change. While climate change may generate economic opportunities in some parts of the world, the adverse impacts of climate change are projected to outweigh its benefits, particularly in developing countries. Climate change has the potential to exacerbate disaster risks, water stress, food insecurity, health risks, natural resource depletion, gender inequalities, social and economic marginalisation, conflict and migration. Climate change impacts are also expected to adversely affect transport networks and other infrastructure, and activities such as tourism. Sea-level rise and accelerated coastal erosion poses an existential threat to some populated areas as well as to critical infrastructure such as coastal oil rigs and power plants. Through these mechanisms, climate change can undermine or even reverse human development, posing serious challenges to the achievement of the Millennium Development Goals (MDGs). This is elaborated in the 2007/2008 Human Development Report, which focuses on climate change, and concludes that successful climate change adaptation, coupled with stringent mitigation, holds the key to human development prospects for the 21st century and beyond. Ultimately, adaptation is an exercise in damage limitation and deals with the symptoms of a problem that must be addressed through mitigation. However, failure to deal with the symptoms will lead to large-scale human development losses (UNDP 2007).[1] The OECD Declaration on Integrating Climate Change Adaptation into Development Co-operation (2006) and the *OECD Guidelines on Integrating Climate Change Adaptation into Development Co-operation* (in preparation) detail the importance of integrating climate change considerations into national development frameworks and international aid efforts.

The *OECD DAC Good Practice Guidance on Strategic Environmental Assessment* (SEA) highlights the need to address environmental risks and opportunities in the

11 Throughout this Note, the term 'climate change' is used to describe any change or variation in climate, at any spatial scale, that deviates from what may be viewed loosely as historical norms to which existing social, economic, agricultural and other systems have more-or-less adapted. Climate change may manifest itself through changes in the frequency, severity and/or duration of transient climate hazards (i.e. individual extreme events such as storms, heavy rainfall, periods of below average rainfall, etc), or through longer term changes involving phenomena such as sea-level rise, progressive climatic desiccation, and climatically-driven changes in ecosystems, water resources etc. The extent to which elevated climate risk is associated with transient and/or long-term hazards will vary with location and over time.

development and appraisal of policies, plans and programmes (PPPs). SEA is being adopted in a growing number of countries and organizations. It also provides a framework for assessing and managing a broad range of environmental risks which may contribute to the integration (or "mainstreaming") of climate change considerations into PPPs. The integration of climate change into strategic planning through the application of SEA should lead to better informed, evidence-based PPPs that are more sustainable in the context of a changing climate, and more capable of delivering progress on human development.

As evidence for and awareness of the risks associated with climate change and its impacts grows, PPPs often need to incorporate considerations of climate change. However, experience and empirical evidence on the inclusion of climate change adaptation considerations in PPPs through SEA is not yet well developed. This is in part attributable to the fact that awareness of the need for adapting to climate change is relatively recent. Moreover, the primary focus of SEAs so far has been to evaluate the impact of a PPP on the environment rather than the impact of environmental change on a PPP.

II. Focus of this Advisory Note

The focus of this Advisory Note is to show how SEA approaches can help mainstream **adaptation** to climate change into strategic planning, in order to reduce the hazards, risks and vulnerabilities posed by climate change to systems and populations (see Box 1). It aims to show how SEA can be used to assess how PPPs might mediate climate change risks, for example by facilitating or constraining adaptive choices and behaviour.

In addition to addressing the impacts of inevitable climate change through adaptation measures, climate change **mitigation** through reductions in emissions and/or enhancing sinks of greenhouse gases is critical. A thorough SEA that looks at the impact of a PPP on the environment should therefore consider greenhouse gas emissions and their consequences. Furthermore it is recognized that adaptation and mitigation are complementary aspects of climate change risk management, and that synergies between these activities exist. However, given the notable differences between adaptation and mitigation in terms of temporal and spatial scales of intervention, key stakeholders and decision processes,[2] mitigation of climate change, while critical, is not addressed in this Advisory Note.[3]

2 See Klein *et al. (*2007) for detailed discussions.

3 For additional information on climate change mitigation, see the IPCC (2007).

Box 1. Hazards, vulnerability and risk

Chapter 18 of the Third Assessment Report (TAR) of the IPCC Working Group II defines vulnerability as the "degree to which a system is susceptible to injury, damage or harm (one part – the problematic or detrimental part – of sensitivity)" (Smit & Pilifosova, 2001, p.894). The IPCC's Fourth Assessment Report (AR4) defines vulnerability as "a function of the character, magnitude and rate of climate change or variation to which a system is exposed, its *sensitivity*, and its adaptive capacity" (IPCC, 2007, p.883). These two definitions of vulnerability as (i) a *component of* sensitivity and (ii) a *function of* sensitivity, are fundamentally different, and have led to some confusion.

The approach to vulnerability that has been adopted widely by social scientists and field practitioners and is adopted in this Advisory Note views the *risk* posed to a system by climate change as a function of:

1. the *exposure* of that system to climate-related *hazards* (*e.g.* episodic hazards such as recurrent droughts, storms, inundation, or other climate-related extreme events; singular hazards such as glacial lake outburst; or continuous hazards such as steady decline in mean annual rainfall);

2. the underlying *vulnerability* of the exposed system, driven by socio-economic, environmental and other factors that affect the ability of the system to resist, absorb, cope with and respond to the impacts of the hazards in question;

3. *adaptive capacity*: the ability of the system to adapt to these changes by changing its properties and behaviour in a way that enables it to resist, absorb, cope with and respond to impacts associated with new or evolving hazards.

Source: See Brooks (2003) for a more detailed treatment of the relationship between risk, hazard and vulnerability[4].

This Advisory Note aims to help development professionals working with SEA in the context of national and sectoral planning, to factor in climate change adaptation issues where warranted [5]. This is referred to in the forthcoming *OECD Guidelines on Integrating Climate Change Adaptation into Development Co-operation* as applying a "climate change adaptation lens" to the PPP in question (Box 2). At a national level, an SEA may help to identify elements of national PPPs that are sensitive to or at risk from climate change, or whose viability in the context of projected future climatic conditions is in question. At a sectoral level, climate change considerations within an SEA might be used to assess strategies for sectoral reform to identify which strategies are, and which are not, resilient under different climate change scenarios, or to identify where adaptation interventions will be required to enhance the resilience of the sector in the face of climate change. For example, in areas facing increasing water stress, the water requirements associated with different strategies for reform of the agricultural sector may determine which sectoral PPPs are most practical and sustainable in different climate change

5 The guidance can also be helpful for other policy analysts, planners and practitioners such as representatives of the consulting and private sectors and Non-Governmental Organizations.

scenarios. In the tourism sector, the viability of different strategies and associated PPPs for the expansion of coastal tourism might be assessed for different rates and magnitudes of sea-level rise.

This Advisory Note therefore aims to demonstrate how SEA and related approaches may facilitate the integration of climate change adaptation considerations into planning and decision-making. It is not a prescriptive blueprint and it does not assume that all SEAs should include climate change considerations. It is intended as a point of reference and targets PPPs that are likely to be influenced by and hence need to adapt to climate change or influence adaptive capacities in some way.

Box 2. Applying a 'climate lens' in strategy or PPP formulation

A climate adaptation lens is an analytical process/step/tool to examine a policy, plan or programme (PPP). The application of a climate adaptation lens at the national or sectoral level involves examining:

1. the extent to which the PPP under consideration could be vulnerable to risks arising from climate variability and change;
2. the extent to which climate change risks have been taken into consideration in the course of formulation of the PPP;
3. the extent to which the PPP could lead to increased vulnerability, leading to 'maladaptation' or, conversely, miss important opportunities arising from climate change; and
4. for pre- existing PPPs which are being revised, what amendments might be warranted in order to address climate risks and opportunities (sometimes referred to as 'climate-proofing').

A first quick application of the climate lens should enable a policymaker to decide whether a PPP is at risk from climate change. For a PPP that is not at risk, no further work needs to be done. However, for a PPP that is at risk, further work is required to identify the extent of the risk, assess climate change impacts and adaptation responses in more detail and identify possible recommendations and 'downstream' actions.

Source: OECD DAC (in prep).

The information and questions outlined below are relatively generic and are intended to be adapted to partner country circumstances, development agency mandates, the specificities of the targeted policies, plans and programmes, and the objectives of including climate change adaptation in the SEA (*e.g. raising awareness at high policy level or mainstreaming adaptation*).

More detailed information on the impacts of climate change on developing regions and key sectors, and on points for intervention, will be provided in the forthcoming *OECD Guidelines on Integrating Climate Change Adaptation into Development Co-operation.* Other detailed guidance related to climate change integration and management is available from the sources listed in Section 6.

III. Addressing Climate Change Adaptation through SEA: Key Steps and Questions to Ask

This section outlines key climate change adaptation-related questions to consider for the four main stages of an SEA (see Box A1.2 in Annex 1). While climate change adaptation may be relevant at any of the twelve main entry points for SEA (see Box A1.1 in Annex 1), this section focuses on two specific entry points which provide key opportunities for the integration of climate risk management: (a) national overarching policies, plans and programmes, and (b) national sectoral policies, plans and programmes. However, many of the questions in this section are applicable across all twelve entry points.

National overarching strategies, plans and programmes are strategic planning documents which outline the long-term development objectives of national governments. They include National Development Plans, Poverty Reduction Strategies and National Sustainable Development Strategies. Consideration of climate change at this level can shape downstream priorities and provide a framework to facilitate adaptation and mitigation integration at lower levels (*e.g.* sectoral, regional, project levels).

National-level sectoral policies, plans or programmes define key orientations and policy parameters that govern the development of a sector over the long term and outline the main long term objectives and development plans. PPPs are frequently developed in isolation but, in practice, are closely inter-related across sectors and their interactions need to be considered.

Box 3 presents the case of Jamaica, where SEA has been identified as a useful tool to mainstream climate change considerations in national overarching policies as well as into sector-level policies, plans and programmes.

Box 3. Potential application of SEA for integrating climate change into national and sectoral-level policies, plans and programmes

In Jamaica, a need has been identified for mainstreaming disaster risk reduction and climate change adaptation into national policies as well as policies for key development sectors vulnerable to climate risks (physical development, agriculture and fisheries sectors). The island is at high risk because of the small population and limited land space, its exposure to tropical cyclones, low lying geography and narrow economic base (beach tourism, limited agriculture and some financial services). Increased tropical storm intensity represents a major risk: without strategies to address this risk in physical planning, construction, location of human settlements and placement of infrastructure, the country and especially the poorest will suffer significant losses every year. Adaptation to climate change rather than mitigation is the priority as the contribution of the country in terms of carbon emissions is very small (particularly as the country imports over 90% of its energy). SEA has been identified as a useful mechanism for the integration of climate change considerations into national and sectoral-level policies, plans and programmes, subject to further elaboration of an appropriate SEA approach for Jamaica.

Source: David C. Smith, UNDP Jamaica Country Office.

The extent to which climate change considerations can be incorporated into an SEA, the level of detail required in the SEA process, and the relevance of the various questions outlined below, will depend on the entry point and the development activities and processes. Those implementing the SEA should select the questions from Tables 1-4 which are most appropriate to the context in which they are operating, and might adapt some of the questions for application to entry points other than national overarching and sectoral PPPs. The guidance presented here therefore provides a "menu" from which decision-makers may select relevant sets of questions appropriate to the entry point and PPP of concern.

Step 1: Establishing the Context

The context of a PPP will determine whether or not climate change adaptation is a relevant consideration in the SEA process. For example, this will depend on how sensitive the affected sectors are to climate change. In some instances it will be clear that adaptation to climate change is highly relevant to a PPP, as the associated development activities are inherently sensitive to climate variability and change (*e.g.* agriculture, water resources), while in other cases climate change may not pose any direct threat. However, in many instances the extent to which climate change will require adaptive responses may be unknown or contested. The nature or extent of the risks posed by climate change to development activities may only become evident if projected development trends are examined in parallel with projected changes in climate. The questions provided in Table 1 are therefore not designed to categorically exclude/include climate change considerations in the SEA of certain PPPs but rather to trigger the identification of potential relevancy to climate change adaptation.

In addition to screening and setting objectives, establishing the context involves identifying who the key stakeholders concerned with climate change adaptation are and where and how they should be involved in the SEA process. Key stakeholders will be (i) those who are concerned with the development and implementation of the PPP (*e.g.* government ministries & agencies, as well as climate change specialists), (ii) those who are particularly vulnerable to climate change and who will be affected by the PPP, and who therefore have an interest in enhancing the resilience of the PPP to climate change *(e.g.* populations (areas and groups) with high levels of exposure and vulnerability to climate change related risks), and (iii) those likely to be affected by and involved in the implementation of measures to respond to climate risks (*e.g.* private businesses, communities). Mechanisms will need to be developed to bring together stakeholders from all three categories and to manage vested interests and conflicts of interest. Participatory decision-making and enhancing transparency and accountability are key approaches. Many countries have, for instance, established national platforms for disaster risk reduction, bringing together different stakeholders and technical institutions concerned with climate change adaptation.[6] Box 4 presents the case of the city of Durban, South Africa, where a participatory approach was adopted in an integrated assessment framework (IAF) work plan that will enable Durban City representatives to simulate, evaluate and compare strategic development plans for the city in the context of climate change.

6 A list of focal points for national platforms for disaster risk reduction may be found on Prevention Web: http://www.preventionweb.net/english/hyogo/national/

Box 4. An integrated assessment model for mainstreaming climate change considerations into Durban's development plan and for increasing adaptive capacity

Durban, a coastal city in South Africa, has embarked on the Climatic Future for Durban Programme, which will provide strategic inputs into the preparation of the City's Integrated Development Plan and allow the Ethekwini Municipality to factor climate change considerations into its long-term planning and budgeting. The programme consists of three main phases of which the first two have already been completed. **Phase 1** highlighted the vulnerability of the City to a certain number of critical climate change impacts (*e.g.* increases in vector borne disease, increased infrastructure damage due to extreme weather events). **Phase 2** focused on how the City might respond to these threats and put in place adaptation measures. **Phase 3**, in preparation, **aims to develop a model-based integrated assessment framework (IAF) that will enable Durban City representatives to simulate, evaluate and compare strategic development plans for the city in the context of climate change**. The IAF, essentially an SEA-type approach, will address two timeframes: 2030-2040 and 2100. The IAF workplan has been developed using a participatory approach (with the involvement of a steering committee composed of key city officials, councillors and local academic representatives). Model design and parameterisation includes, among other factors: the identification of key sectors/vulnerabilities; the confirmation of critical global climate change trends and assumptions; the identification of critical climate changes, adaptation and mitigation components of development scenarios; and implications of global climate change trends for key development sectors in Durban.

Source: Dr. Debra Roberts (Deputy Head, Environmental Management Development Planning and Management Unit), Ethekwini Municipality, Durban, South Africa.

Table 1. Questions to consider in Step 1 of the SEA - Establishing context

1.1 Assess the need for climate change considerations in the context of SEA
• Which key national development priorities (*e.g.* economic growth, enhanced food security, conflict resolution, improved access to clean water resources, improved health status, improved gender equality), geographical areas (*e.g.* low-lying coastal areas, semi-arid regions, riverine floodplains), and/or sectors (*e.g.* agriculture, water, transport, energy) are likely to be particularly affected by climate change[7]? • What are the main climate trends, how are they being monitored and how is information about trends and projections disseminated? Are the impacts and risks[8] of climate-related hazards assessed at geographic and time scales compatible with the scope of the PPP? • What is the level of awareness of climate change and associated risks among planners and society at large, and what systems exist to increase awareness? • For specific sectors, what are the main risks from climate change? (*e.g.* loss of coastal systems for tourism, reduced runoff and recharge for water, increased rainfall variability for agriculture, expansion of disease vector ranges for health) • Are major long-lived/large-scale infrastructure or network development plans under preparation, and if so, have impacts of climate change been taken into account? (*e.g.* have plans for hydro-electric plants examined rainfall/runoff projections; have plans for expansion of coastal development accounted for sea-level rise, accelerated erosion and intensified storm risk?) • Has climate change been considered in National Development Plans or Poverty Reduction Strategies? • Is there a national climate change strategy in place (*e.g.* National Adaptation Programme of Action (NAPA)) that the PPP would need to be fully-aligned to or at least consistent with? • What are the main ongoing or planned national and regional activities relating to adaptation to and mitigation of climate change? What are the links between adaptation and mitigation at the regional and national levels? • What are the relevant international climate change commitments (*e.g.* UNFCCC, Kyoto, etc.) with which PPPs should be consistent (*e.g* mitigation commitments for energy or land use PPPs)?
1.2 Setting Objectives
The following aspects could be included under the objectives of the SEA: • assessing the viability of existing or planned PPPs under different climatic scenarios; • ensuring sustainability of sectoral reform, etc; • identifying key vulnerabilities within specific sectors or in existing or planned PPPs; • shaping the development of the specific outcomes of the PPP considering a long-time horizon and specific risks related to climate change; • ensuring that the potential of climate change to affect the viability of certain targets associated with the PPP is taken into account when these targets are set (examples include MDG related national targets such as increasing access of urban populations to a safe supply of water from 85 to 95% by 2015; increasing energy efficiency by 15 to 20% by 2010[9]; climate change is likely to reduce the availability of fresh water in many parts of the world, and may adversely affect energy production via impacts on hydro-power, forcing greater dependence on fossil fuels in the absence of adaptation).

7 National Adaptation Programmes of Action (NAPAs): http://unfccc.int/adaptation/napas/items/2679.php) can provide relevant information on these aspects

8 Difference between "impacts" and "risks" and guidance for risks assessment and management are described in the report mentioned above (Australian Government. 2006), section 2.3.

9 Other examples of national overarching strategies targets are provided in UNDP. 2006. *Making Progress on Environmental Sustainability: Lessons and Recommendations from a Review of over 150 MDG Country Reports.*
http://www.energyandenvironment.undp.org/index.cfm?module=Library&page=Document&DocumentID=5951

1.2 Setting Objectives

The following aspects could be included under the objectives of the SEA:

- assessing the viability of existing or planned PPPs under different climatic scenarios;
- ensuring sustainability of sectoral reform, etc;
- identifying key vulnerabilities within specific sectors or in existing or planned PPPs;
- shaping the development of the specific outcomes of the PPP considering a long-time horizon and specific risks related to climate change;
- ensuring that the potential of climate change to affect the viability of certain targets associated with the PPP is taken into account when these targets are set (examples include MDG related national targets such as increasing access of urban populations to a safe supply of water from 85 to 95% by 2015; increasing energy efficiency by 15 to 20% by 2010[10]; climate change is likely to reduce the availability of fresh water in many parts of the world, and may adversely affect energy production via impacts on hydro-power, forcing greater dependence on fossil fuels in the absence of adaptation).

1.3 Identifying Stakeholders

- Which decision-making bodies are most involved with affected sectors/activities? (*e.g.* sectoral ministries)
- For overarching PPPs, which sectors are most relevant? (*e.g.* for developmental goals relating to health and food security, health, agriculture and water will be key sectors)
- Which groups (*e.g.* demographic or socio-economic groups) and geographic areas experience highest exposure to existing climate-related risks, *e.g.* droughts, floods, ENSO-related[11] climate variability? (*e.g.* for a PPP related to coastal zone management, communities in low-lying coastal areas will be key stakeholders)
- Which groups will be most affected (both positively and negatively) by possible adaptation interventions? (*e.g.* poor households by water pricing, energy-intensive businesses by increased fuel costs, coastal communities by managed realignment)

Step 2: Implementing the SEA

Implementing the SEA requires scoping the work to be undertaken for the SEA, collecting baseline data, and identifying how to enhance opportunities and mitigate risks. In a climate change adaptation related SEA, implementation will depend on what country-specific climate change data and projections are available at scales relevant to the PPP and where there are major information gaps, and what capacities exist for the collection, management, interpretation and dissemination of information needed to assess the climate change risks that might affect the PPP. Data on climate variability, extreme events and related patterns of vulnerability should be collected for analysis in light of projected changes in precipitation and sea-level rise and changes in the socio-economic and environmental conditions that will affect vulnerability to climate related hazards. This data may be available from previous studies and assessments, and documents such

10 Other examples of national overarching strategies targets are provided in UNDP. 2006. *Making Progress on Environmental Sustainability: Lessons and Recommendations from a Review of over 150 MDG Country Reports.*
http://www.energyandenvironment.undp.org/index.cfm?module=Library&page=Document&DocumentID=5951

11 ENSO, or El Niño-Southern Oscillation, is a system of interactions between the equatorial Pacific Ocean and the atmosphere above it, resulting in periodic changes to the atmospheric and oceanic circulation which are associated with a variety of climate hazards such as drought and intense rainfall, as well as changes in oceanic productivity and other impacts such as increased risk of wild fires.

as National Adaptation Programmes of Action (NAPAs) from the Least Developed Countries,[12] National Communications by non-Annex I Parties to the UN Framework Convention on Climate Change (UNFCCC),[13] and climate change (risk) vulnerability maps. If crucial information is not available or is inconsistent, *ad hoc* studies may need to be commissioned in the early stages of the SEA process to fill these critical information gaps.

It is important to assess what institutional capacities exist to assess and manage climate change risks, and how these capacities can be enhanced. A variety of bodies will be mandated to manage risks related to climate change and variability on a range of timescales. Certain Ministries will be responsible for planning and policy formulation in climate-sensitive sectors such as water, agriculture and coastal development. Government agencies, non-governmental organisations (NGOs) and community-based organisations (CBOs) will have remits that include a range of risk management measures, ranging from collecting and disseminating information related to climate risks and hazards to implementing risk and vulnerability reduction measures. The private sector will also play a key role in influencing development pathways that may amplify or reduce climate-related risks. It is important that such bodies are able to access, interpret and act on information related to climate change, its potential impact on development activities and process, and the various adaptation options that are available for ensuring that these activities and processes are neither undermined by climate change nor "maladaptive" (*i.e.* ensure that these processes do not lead to increased vulnerabilities). Capacities to assess and manage climate risks will be enhanced by disseminating information about these risks at the institutional level, raising awareness among staff, and improving coordination between and across institutions in relation to climate risk management.

While SEA does not provide a framework for the initiation and management of *research* into climate change and its impacts, the SEA process is likely to highlight gaps in knowledge and information. The SEA may help to assess the extent and efficacy of systems for monitoring (i) key variables that can yield information on climate change *(e.g.* rainfall amounts and variability, rates of sea-level change, incidences of climate-sensitive pests and diseases, nature and frequency of extreme events and climate-related hazards, losses from climate-related extremes), (ii) factors that contribute to the vulnerability of natural and human systems to climate change. If, *e.g.* the inception phase of a wide-ranging programme of reforms in a high-risk sector is assessed in the context of an SEA, this will necessitate detailed risk assessment and ongoing risk monitoring; as a consequence, gaps in information or capacities to generate information will be unveiled at an early stage.

It is then important to consider what adaptation responses (options) could reduce climate change risks and improve the development outcomes of the policy, plan or programme. For example, what capacity building measures could be taken to reduce vulnerability to climate change and to promote adaptive behaviour? What specific adaptation interventions could reduce risks associated with specific, identifiable climate

12 Submitted NAPAs are available from http://unfccc.int/adaptation/napas/items/2679.php.

13 Most countries are currently preparing their Second National Communications (SNCs) and therefore consultations with the national SNCs teams should be undertaken whenever possible. Details of the SNC teams in different countries can be found at http://ncsp.undp.org/national_team.cfm. Submitted Initial National Communications (INCs) are available at http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php.

change hazards (*e.g.* sea-level rise, drought, changes in the frequency and severity of extreme events)? Adaptation measures will need to be assessed on the basis of their feasibility, efficacy and acceptability, for example through stakeholder-driven multi-criteria assessments. It will be important to assess whether the different adaptation options are robust under different climate change scenarios in order to ensure that they represent "no-regrets" interventions, particularly where climate change impacts are associated with high levels of uncertainty. In addition, implementing adaptation measures may require mediation between different interest groups, for example involving conflict resolution.

Box 5 shows two examples of how Strategic Environmental Assessment (SEA) has facilitated the consideration of climate change concerns and the recommendation of adaptation measures for sectoral plans in Viet Nam.

Box 5. Strategic Environmental Assessment as a tool to integrate climate change adaptation in Viet Nam

Vietnam is one of the developing countries that has legal provisions for Strategic Environmental Assessment (SEA) of regional and sector plans. Article 14 of the Law on Environmental Protection (LEP) of 2005 requires SEA for various categories of strategies and action plans related to socio-economic development at different levels of government, including for land use, forest protection and development, natural resource development, and river basin development. The law requires that SEAs cover environmental, social and economic impacts. The legal frameworks and implementation guidance for SEA in Viet Nam is generally consistent with the OECD DAC Guidance on Applying SEA (OECD, 2006). They provide a sound potential framework for integrating climate change considerations into sector and spatial development planning. While the SEA law does not entail detailed provisions for how to take climate change into account, the draft guidelines for general SEA application prepared by Vietnam propose the consideration of climate change impacts and risks at different steps throughout the SEA procedure.

Vietnam is rapidly accumulating experience in SEA, applied across a range of administrative levels and spatial scales. The following two SEA cases demonstrate how SEA has helped to integrate climate change adaptation into a regional land use plan and a sub-national sector plan.

SEA of Land Use Planning for the Nhon Trach district

An SEA was conducted in 2007/2008 to integrate environmental issues into the land use planning for the Nhon Trach district near Ho Chi Minh City. An assessment of the possible consequences of climate change for Nhon Trach district was made as part of the SEA. Accordingly, the SEA report proposes not only environmental protection solutions, but also measures for adapting to the expected climate change impacts, including estimated costs and implementation arrangements. The assessment of climate change impacts included analyses of possible temperature increase, precipitation changes, sea level rise, and salt water intrusion. Proposed recommendations and measures for adapting to climate change included:

- Dyke systems to prevent the invasion of seawater in the district should be continued to be maintained and further developed.
- New varieties/species of crops should be identified, and an adaptation of cropping systems is needed in order to reduce the vulnerability of the agricultural system to climate change impacts.
- Tree coverage for the agricultural land converted to other use such as dwelling or construction land should be at least 15% in order to contain soil erosion.
- The drainage system should be better maintained and extended in pace with urban development, and urban and industrial parks environmental management should be enhanced, including regular dredging, in order to avoid local flooding in the rainy season.
- Existing mangrove forests should be continued to be preserved in the district in order to mitigate increasing hazards from high tides.

SEA of the Quang Nam Province hydropower plan covering the Vu Gia-Thu Bon River Basin

An SEA was conducted, with support from the Asian Development Bank (ADB), on the hydropower development plan for the Vu Gia – Thu Bon River Basin 2006-2010. Climate change was considered as one of 15 key issues to be addressed by the SEA. However, some of the climate change concerns were not quantifiable as predictive or spatial models for the study area, particularly for the time frame of the study (20 years), were not available. The analysis of climate change impacts was therefore largely qualitative, based on extrapolation from available literature (mainly IPCC, 2007). However, a range of important climate change impacts on the hydrology of the basin were identified: increased rainfall intensity and variability; increases in size of extreme flood flows, resulting in larger sediment transport and sand excavation; sea level rise affecting flooding in the seaward parts of the Delta; increases in temperature and higher evapotranspiration leading to lower dry season minimal flows with effects on salinity intrusion.

The SEA concluded that the pace and scale of the proposed hydropower development was at an unsustainable level and recommended a number of fundamental principles to enhance the sustainability and equity of the hydro sector in the basin. One of these principles highlights "safe operations", recommending the implementation of operational regimes and institutional arrangements to reduce droughts and floods and prepare for disasters; the need to incorporate climate change parameters in design and management is explicitly mentioned. In addition, the results from the climate change analysis gave support to some strategic recommendations regarding the need for (i) integrated river basin management; (ii) co-ordinated management and water release programs for the 60 dams considered; (iii) needs for improved data collection on climate related issues.

Sources:

Asian Development Bank (ADB), 2009, Strategic environmental assessment as a tool to improve climate change adaptation in the Greater Mekong Subregion.

Vietnam–Sweden Cooperation Programme on Strengthening Environmental Management and Land Administration in Vietnam (SEMLA), 2008, Evaluation of SEMLA SEA Pilot Projects.

ADB, 2008, Strategic Environmental Assessment of the Quang Nam Province Hydropower Plan for the Vu Gia – Thu Bon River Basin, Prepared for the Vietnam Ministry of Natural Resources and Environment (MONRE), Ministry of Industry and Trade (MOIT) and Electricity Vietnam (EVN), Hanoi, Vietnam.

Table 2. Questions to consider during Step 2 of the SEA - Implementation

2.1 Scoping
• Are climate change signals already apparent, and if so, do they affect social and economic development? (*e.g.* impacts of reduced rainfall or increased rainfall variability on food production, or changes in rainfall/temperature correlated with increased incidence of climate-sensitive diseases) • Do existing studies based on extrapolation of current trends or climate change projections identify specific likely or plausible impacts on development? If so, through which mechanisms? (*e.g.* future loss of productive land or salinisation of groundwater due to accelerating coastal erosion and sea-level rise) • How is the exposure and vulnerability to existing and anticipated climate change risks and hazards distributed over different groups? Are sectors or populations that are particularly affected by climate related hazards sufficiently resilient and will they continue to be resilient if extreme climate events become more frequent and intense? (*e.g.* which sectors or populations are most likely to be affected by projected changes - *e.g.* rain-fed agriculturalists in semi-arid areas, low-lying coastal communities) • To what extent have the consequences of climate change for the successful realization of PPPs been assessed for different plausible scenarios of climatic, socio-economic and technological change? (*e.g.* are plans to expand commercial agriculture for increased export earnings viable under scenarios of future changes in rainfall and temperature?)
2.2. Collecting baseline data
• What data or tools are available/needed for planning (*e.g* projections from global and regional climate models; specialised models *e.g.* for coastal change, water resources, agricultural productivity; historical analogues *e.g.* of extreme events; demographic data disaggregated by sex, etc.) • To what extent is there uncertainty [14] in climate change data projections? (*e.g.* are there several available projections that present different outcomes, particularly at different time horizons?) • What proportion of population is at significant risk from (i) existing climate hazards and (ii) projected climate risks and hazards (*e.g.* how many people (i) are affected by flooding each year, are classified as vulnerable to drought, (ii) live in low-lying areas that will be subject to increasingly severe and frequent flooding due to increases in rainfall intensity and/or sea-level rise and changes in other coastal risks such as storm intensity?) • What are the losses, and what is the impact on GDP, associated with existing climate hazards? (*e.g.* what are the economic losses from flooding, drought, storms etc; what are percentage losses of GDP due to agricultural production deficits associated with droughts or floods; how much is spent on emergency food imports during drought years; what are the costs incurring to the energy sector due to drought impacts on hydro-power, etc). • What strategies are employed to address climate risks and hazards? (*e.g.* agricultural diversification and spatial heterogeneity in planting to cope with unpredictable rainfall; energy rationing; storm and flood early warning systems, etc.) • What are the arrangements for continuous data collection and interpretation, and for advising the choices and decisions about current and future adaptation needs? Baseline data should be available in documents such as NAPAs, National Communications, and studies undertaken by bodies such as the World Bank, UNDP, UNEP, and bilateral donors.

[14] Addressing uncertainties associated with climate change is well explained in: Australian Government. 2006. *Climate Change Impacts and Risk Management: a Guide for Business and Government*, section 7.2.

http://www.greenhouse.gov.au/impacts/publications/pubs/risk-management.pdf

2.3 Identifying how to enhance opportunities and mitigate impacts

- How can sectoral PPPs assist people living in remote areas with limited adaptation options? *(e.g.* where rain-fed agriculture is increasingly marginal and expansion of irrigation is impractical, can opportunities for pastoralism be exploited and promoted to complement or substitute for agricultural activities? Can policy interventions in partnership with international bodies promote risk spreading via mechanisms such as climate and weather derivative insurance?)
- Could measures to reduce disaster risk support adaptation to climate change (*e.g.* preparedness planning, improved zoning laws and building codes, risk education and early warning systems such as improved flood and storm early warning systems [15] for low-lying flood-plains and coastal areas, drought early warning systems in drylands, and monitoring of changes in water availability due to reduction of glacier melt-water, etc)
- How can information on climate change projections be tailored to community needs, *e.g.* within particular sectors? (*e.g.* how can climate change projections be presented to farmers (both men and women) within the context of traditional practices and incorporating existing local knowledge [16] ?)
- What other risk management options could be incorporated to facilitate adaptation? Do these options also deliver mitigation benefits? (*e.g.* changes in land-management and cropping practices to promote soil, water and biomass conservation may help adaptation to reduced rainfall amounts and increased rainfall variability, as well as delivering benefits in terms of carbon sequestration and earning credits under the Clean Development Mechanism or other carbon trading/accounting systems)
- How can potential adaptation options be sequenced, and what are the decision making structures and processes required to ensure that adaptation options are selected and adjusted to new information on climate trends, *e.g.* thanks to improved forecasting skills?

2.4 Identifying alternatives

- Where proposed PPPs might fail to deliver its development outcomes due to climate change impacts, are there any alternative options that are likely to be more effective under the given climate change scenario? (*e.g.* where reduced rainfall may affect viability of hydro-power generation, hydro could be substituted or complemented with micro-generation including biogas, solar, etc; where investment in water-intensive commercial agriculture on a large scale will be lost due to decreased water availability, pilot drought-resistant crops and water conservation may be options, and support for resilient smallholder agriculture may offer an alternative; where coastal areas are under existential threat from sea-level rise, the focus should be on development in lower-risk areas, etc.).
- How can alternatives to practices that are unsustainable in the face of climate change be promoted? (*e.g.* sectoral interventions to promote more sustainable use of water and energy via conservation programmes).
- What mechanism or structure (*e.g.* establishment of a climate change commission regrouping national and infra-national stakeholders) should be adopted to prompt lower-level decision-makers (*e.g.* regional, project-levels) to examine climate change risks and to cooperate and coordinate with other agencies and sectors in order to reach collaborative climate change responses?
- What key policy and legislative changes are required to promote adaptation in the context of a PPP? (*e.g.* Are current zoning and building codes adequately enforced? Are existing policy trends and reforms such as restructuring of agricultural sectors promoting or inhibiting adaptation and mitigation, *e.g.* through the ability of farmers to innovate, experiment and invest; are trends such as agricultural commercialization increasing or decreasing flexibility and dependence on diminishing resources such as water? [17])

15 For more details, see EEA (2007)

16 See FAO (2007).

17 For an example of how agricultural restructuring has had negative impacts on farmers' adaptive capacity see: Eakin, H. (2005).

Step 3. Informing and Influencing Decision Makers

The presentation of the conclusions of an SEA to decision makers is a crucial step in a SEA process. How information on climate change risks to the PPP is communicated to decision makers and how they are informed about possible adaptation measures is key to facilitating informed decision making. In addition, it is crucial to assess what incentives there are for decision makers to take climate change considerations into account, and if there are any reasons why they may be likely to neglect (long-term) climate change impacts or object to integrating adaptation measures into PPPs. Opposition to adaptation measures may arise from insufficient prior consultation or inclusion of stakeholders. It may also stem from a lack of knowledge or awareness of climate change risks among decision-makers or those able to influence them (including voters and lobbyists), or a (related) lack of political will. Another important consideration is whether attempts to build climate change adaptation measures into PPPs may induce or contribute to existing conflicts of interest between different affected stakeholders.

Table 3. Questions to consider in Step 3 of the SEA - Informing and influencing decision-makerS

3.1 Making recommendations
• How can information on climate change, its impacts, and appropriate adaptation responses be communicated to senior decision-makers within overarching and sectoral contexts? What additional measures are needed for improving communication infrastructure, and for training educators and media to understand and interpret information relevant to climate change? See McGray et al. (2007) for more details.
• What incentives can ensure that the identified adaptation measures are integrated in overarching or sectoral PPPs? (*e.g.* policy drivers, new legislation, development and enforcement of regulation, taxes on carbon emissions, financial assistance to facilitate practices resulting in adaptation and mitigation)
• Are there any existing conflicts of interest between different groups affected by the PPP and the identified adaptation measures? Might such conflicts be aggravated by the integration of identified adaptation measures into the PPP?

Step 4. Monitoring and Evaluation

It must be ensured that the recommendations made in the SEA report, including with regard to climate change adaptation, are considered in the monitoring and evaluation of the PPP. Therefore, when developing monitoring and evaluation methods for the identified adaptation measures, it is important to align them as far as possible, if applicable, to those established in the performance management framework created for the PPP. The questions in Table 4 below provide an idea of possible questions to consider when developing monitoring and evaluation methods related to climate change adaptation.

Table 4. Questions to consider in Step 4 of the SEA - Monitoring and evaluatioN

4.1 Planning the monitoring of the PPPs
• What tools and indicators might be used to assess adaptation measures in terms of development outcomes? Indicators must be developed, for example, for monitoring how water management activities in the country are driving changes in crop selection by farmers, and for assessing whether those changes are sustainable in light of changes in water availability; if they are not sustainable, it must be identified how management regimes can be adjusted. Indicators of vulnerability (*e.g.* in terms of food insecurity) provide a natural entry point for monitoring the impact of vulnerability-reduction and resilience-building interventions.[18] For example, a list of climate change indicators relevant for SEA is provided in Levett-Therivel Sustainability Consultants et al. (2007). • How and by whom (*e.g.* those responsible for developing the PPP, climate change experts, an independent commission) should these indicators be tracked? Are any capacity development measures needed to ensure effective monitoring and evaluation?
4.2 Evaluation of the PPPs
• Did any climatic event or trend affect the achievement of the PPPs' objectives? If so, had the SEA taken such risks into account? • Are there any indications that the PPP lead to increased vulnerability to climate change impacts of the recipient system? Were such impacts anticipated? (Feedback should be solicited from stakeholders throughout the SEA and PPP implementation process so that negative or counterproductive impacts may be identified at an early stage.) • Did the PPP contribute to verifiable progress on climate change related development issues (*e.g.* agricultural production and food security, health, water quality and availability)? (Stakeholder feedback will be necessary in order to assess whether any such progress is attributable to the PPP, or is fortuitous).
4.3 Evaluation of SEA process
• Did the SEA result in the integration of climate change considerations into the planning process? • Did SEA provide useful information on climate change risks and opportunities in the context the PPP, and on adaptation measures that could be adopted? What were these measures and were they adopted? • Did SEA improve the capacities of senior decision-makers, civil servants and other stakeholders to understand climate change issues and management? (This might be assessed through questionnaire surveys.) • Did SEA enhance the transparency and accountability of decision-making processes on climate change issues in general and those specifically related to the PPP? • Did the SEA succeed in integrating into the national budget the financial needs for assessing and dealing with climate change risks?

[18] Indicators developed for disaster risk reduction may be appropriate for climate change adaptation. The ProVention Consortium offers guidance on how to select appropriate indicators and provides links to existing work on monitoring and evaluation undertaken by the disaster risk reduction community. http://www.proventionconsortium.org/?pageid=80

IV. Issues to be mainstreamed in all stages of an SEA

There are a number of cross-cutting issues that should be considered in all stages of an SEA. Three of these are highlighted below.

How will gender issues be addressed in the context of adaptation responses? How does climate change affect women and men, girls and boys differently? What are the different strategies that women and men use to *adapt* to climate change? Do any of these strategies reinforce gender inequalities, such as time burdens on women or girls to collect water or firewood for household use? Are women and men equally involved in the planning and decision-making processes at all levels? Are women able to voice their views and influence decisions in these processes? Are mechanisms in place to collect and analyze sex-disaggregated data to inform indicators, monitoring, reporting and evaluation of climate change policies and measures? Will women and girls directly benefit from climate change response strategies? If so, will they benefit equally to men and boys?

How will Indigenous Peoples be affected by climate change? How will climate change affect their pursuit of customary livelihoods and cultural practices, for example as based on the use of ecosystems, as well as access to and use of traditional lands and territories? Will Indigenous Peoples have the ability to participate freely, on the basis of free, prior and informed consent, in the conception, design and implementation of sustainable solutions for managing climate change risks, including monitoring? Will this apply equally to both Indigenous women and men?

What are the barriers to and opportunities for the strategic integration of climate change into PPPs and the implementation of climate change risk management measures? How can cross-sectoral coordination be improved?

V. Capacity Development Considerations

Building and strengthening adaptive capacity is a key component in the efficient integration of climate change considerations into PPP, and in the reduction of vulnerability to climate change. However, two main challenges must be addressed: i) how to inform decision-makers and planners about climate change challenges and how they affect sustainable development, and ii) how to reinforce the institutional use of SEA to mainstream climate change considerations into strategic planning and policy-making processes. A key challenge is to address issues of climate change impacts, adaptation and mitigation over the longer term, while delivering development benefits in the short-term. This will mean identifying and implementing "win-win" development and adaptation options that deliver short-term benefits without increasing the vulnerability to climate change impacts over the longer term (*e.g.* development practices that do not result in the concentration of resources in areas where future risks from flooding, sea-level rise, or other hazards are likely to reverse development gains).

A first step to respond to these challenges is to undertake an assessment of the capacity of the relevant organization(s) to identify climate change threats and opportunities, and to identify and implement appropriate adaptation (and mitigation) responses. Relevant organizations include those that develop or implement PPPs.

Capacity gaps and needs in terms of SEA and climate change adaptation should be identified.[19]

Various options are available to enhance these capacities:

- Provide technical training and awareness-raising workshops on SEA approaches and principles, emphasising how SEA can help facilitate adaptation to (and mitigation of) climate change, and identifying which tools can be used to assess climate risks, etc..

- Support pilot SEAs for mainstreaming climate change into strategic development frameworks, in order to increase understanding of the issues and the SEA process, to build capacity for the identification of climate risks and mitigation and adaptation opportunities, to improve the communication of climate change information within and between institutions, and to document and disseminate good practice.

- Reinforce existing SEA guidance in countries and organizations by integrating climate change considerations more systematically.

[19] Resources are available to help carrying out capacity assessments. See, for example: UNDP (2006).

References and sources of further information

Brooks, N. (2003), *Vulnerability, risk and adaptation: A conceptual framework.* Tyndall Centre Working Paper No. 38, http://www.tyndall.ac.uk/publications/working_papers/wp38.pdf.

Eakin, H. (2005), "Institutional Change, Climate Risk, and Rural Vulnerability: Cases from Central Mexico", *World Development*, Vol. 33, 1923-1938.

EEA (2007), *Climate Change and Water Adaptation Issues*. *EEA Technical report no 2/2007*, section 3.3. European Environment Agency.

FAO (2007). *Adaptation to Climate Change in Agriculture, Forestry and Fisheries: Perspective, Framework and Priorities*, pp. 17-18, ftp://ftp.fao.org/docrep/fao/009/j9271e/j9271e.pdf.

IPCC (2007). *Mitigation for Climate Change*. Contribution of Working Group III to the Fourth Assessment Report of the IPCC, http://www.ipcc.ch/ipccreports/ar4-wg3.htm.

Klein, R.J.T., *et al.* (2007), "Inter-relationships between adaptation and mitigation" in: M.L. Parry, et al. (eds.), *Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, UK.

Levett-Therivel Sustainability Consultants *et al*. (2007), *Strategic Environmental Assessment and Climate Change: Guidance for Practitioners,* http://www.environment-agency.gov.uk/commondata/acrobat/seaccjune07_1797458.pdf.

McGray H. *et al*. (2007), *Weathering the Storm: Options for Framing Adaptation and Development*, United Nations Food and Agriculture Organization (FAO), Rome, http://pdf.wri.org/weathering_the_storm.pdf .

OECD Development Assistance Committee (DAC) (2006), *Applying Strategic Environmental Assessment: Good Practice Guidance for Development Cooperation.* DAC Guidelines and Reference Series, OECD, Paris, http://www.seataskteam.net/index.cfm?module=Forums&page=Forum&ForumID=237

OECD DAC (in prep.), *Guidance on Integrating Climate Change Adaptation into Development Co-operation*, forthcoming 2009. OECD, Paris.

Smit, B. and O. Pilifosova (2001), "Adaptation to climate change in the context of sustainable development and equity, in: *Climate Change 2001: Impacts, Adaptation and Vulnerability*, Contribution of Working Group II to the Third Assessment report of the Intergovernmental Panel on Climate Change, WMO/UNEP, 877-912.

United Nations Development Program (UNDP) (2005), *National Capacity Self Assessment Resource Kit*,

http://dgef.unep.org/capacity_building/NCSAs/guidebook/file.2006-12-07.8961459550.

UNDP (2006), *Capacity Assessment Practice Note*, http://www.capacity.undp.org/index.cfm?module=Library&page=Document&DocumentID=5510) UNDP (2007). *Human Development Report 2007/2008, Fighting Climate Change: Human Solidarity in a Divided World*, p. 198. Available at: http://hdr.undp.org/en/reports/global/hdr2007-2008

Tools and data analysis relevant for addressing climate change considerations in SEA:

- Canadian International Development Agency SEA Support tool: Aims to assist a program manager or analyst in identifying the environmental linkages to a potential policy, plan or program that might otherwise go unnoticed. It takes the form of a checklist and considers, amongst other things, linkages to climate change vulnerability, adaptation, capacity building, sequestration, and appropriate technology. Copies available by emailing Peter_Croal@acdi-cida.gc.ca
- IPCC Reports: Assessment reports that provide a comprehensive and objective synthesis of the latest scientific, technical and socio-economic findings relevant to the understanding of the risk of climate change globally. The website includes also IPCC special reports, methodology reports, technical papers and supporting material. http://www.ipcc.ch/ipccreports/index.htm
- IUCN-Gender and Environment: Resources such as fact sheets, case studies, manuals, etc., on gender equity and equality in environment and conservation initiatives. http://www.genderandenvironment.org
- Knowledge Network on Vulnerability and Adaptation to Climate Change Resource Center: This is the National Communications Support Programme's (NCSP) library of literature, guidance documents, software packages and data sources for undertaking the various tasks involved in assessing climate change impacts, vulnerability and adaptation for the preparation of national communications by Non-annex I Parties to the UNFCCC. http://ncsp.va-network.org/section/resources
- ORCHID: Systematic climate risk management methodology which assesses the relevance of climate change and disaster risks to an organization's portfolio of development project.

  http://www.ids.ac.uk/index.cfm?objectId=1A1A5005-AC68-2058-03415B11AED09B47
- UNDP Adaptation Learning Mechanism: A project aimed at capturing and disseminating adaptation experiences and good practices via an open knowledge platform. http://www.undp.org/climatechange/adapt/alm.html
- UNFCCC National Communications: Reports on the steps taken by the UNFCCC Parties to implement the United Nations Framework Convention on Climate Change. Included in these reports are national climate change vulnerability and adaptation assessments. http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php
- UNFCCC National Adaptation Programmes of Action (NAPAs): NAPAs identify Least Developed Countries' (LDC) priority activities to respond to their urgent and immediate needs with regard to adaptation to climate change. The NAPAs are action-oriented, country-driven, flexible and based on national circumstances. The preparation of NAPAs was funded through the Least Developed Countries Fund (LDCF), and implementation of identified LDC priorities is now underway based on priority project profiles, also through the LDCF. http://unfccc.int/adaptation/napas/items/2679.php
- UKCIP Adaptation Wizard: Open-source web-based tool designed to help the user to understand climate change and to integrate climate change into decision-making. It contains four steps consisting of impacts information, quantification of risks, decision support and planning, and an adaptation strategy review. http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=147&Itemid=273
- WE-ADAPT: An interactive space where users and experts share knowledge and experience on climate adaptation. Web space contains core themes on Framing Adaptation, Risk Monitoring, Decision Screening, and Communication, as well as tools and methods, worked examples and useful guidance to aid adaptation planning and implementation.
- Women's Environment and Development Organization (WEDO): Resources and information on the intersection of gender equality and climate change. http://www.wedo.org

Guidance sources to support integration of climate change in SEA:

- Australian Government (2006), *Climate Change Impacts and Risk Management: a Guide for Business and Government*, http://www.greenhouse.gov.au/impacts/publications/pubs/risk-management.pdf
- Levett-Therivel Sustainability Consultants, *et al*. (2007), *Strategic Environmental Assessment and Climate Change: Guidance for Practitioners.* http://www.environment-agency.gov.uk/commondata/acrobat/seaccjune07_1797458.pdf
- Lim B., *et al.* (2004), *Adaptation Policy Frameworks for Climate Change. Developing Strategies, Policies and Measures*, http://www.undp.org/gef/05/kmanagement/pub_practitioner.html
- McGray H., *et al.* (2007), *Weathering the Storm: Options for Framing Adaptation and Development*, http://pdf.wri.org/weathering_the_storm.pdf.
- United Nations Economic Commission for Europe (UNECE) (2007), *Resource Manual to Support Application of the UNECE Protocol on Strategic Environmental Assessment. Final Draft. Links to extra resources: Climate Change.* http://www.unece.org/env/eia/sea_manual/links_climate_change.html
- United States Agency for International Development (2007), *Adapting to Climate Variability and Change: A Guidance Manual for Development Planning*, http://www.usaid.gov/our_work/environment/climate/docs/reports/cc_vamanual.pdf
- United Kingdom Climate Impacts Programme (UKCIP) (2003), *Climate Adaptation: Risk, Uncertainty and Decision Making*, http://unfccc.int/files/adaptation/methodologies_for/vulnerability_and_adaptation/application/pdf/united_kingdom_climate_impacts_programme__ukcip_.pdf.
- United Nations Development Programme (UNDP) (2007), *Technical Paper: Framework to Apply the Strategic Environmental Assessment Approach to Adaptation*, Final Draft, May 5, 2007., http://www.seataskteam.net/index.cfm?module=Library&page=Document&DocumentID=6532.
- World Bank, *World Bank ADAPT tool: A computer-based tool (Assessment and Design for Adaptation to Climate Change: a Prototype Tool)*, for screening proposed development projects for potential risks posed by climate change and variability. The tool is meant for use by development practitioners, including bank staff, bilateral agencies, NGOs and client governments, http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCC/0,,contentMDK:21315054~menuPK:3725076~pagePK:210058~piPK:210062~theSitePK:407864,00.html.

Annex 1:
The OECD DAC Guidance on SEA

Strategic Environmental Assessment (SEA) supports the principles of the Paris Declaration on Aid Effectiveness in terms of ownership, alignment, harmonisation, managing for development results and mutual accountability. In this Declaration, both donors and development country partners made a commitment to "develop and apply common approaches for 'strategic environmental assessment' at the sector and national levels".

In response to this commitment, the OECD DAC Network on Environment and Development Cooperation (Environet) has developed SEA guidance (OECD DAC 2006). It provides a commonly-agreed and shared framework for developing appropriate, fit-for-purpose applications of SEA in diverse areas. It is targeted at professionals in development agencies and in partner countries that are directly involved in PPP development.

The OECD DAC SEA Guidance defines SEA as "*analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the inter linkages with economic and social considerations*". Hence, SEA is not a single, fixed and prescriptive approach, but rather an umbrella approach using a basket of analytical and participatory tools. It is largely principles-based and adaptive, focused on strengthening institutions and governance, and tailored to a specific context. The core of the Guidance is organized around 12 broad entry points for the application of SEA to different areas of strategic decision making (Box A1.1). This Advisory Note applies to all of these.

BOX A1.1: Key entry points for sea in development co-operation

(A) For SEA led by partner country governments

1. National overarching strategies, programmes and plans
2. National policy reforms and budget support programmes
3. National sectoral policies, plans or programmes
4. Infrastructure investments plans and programmes
5. National and sub-national spatial development plans and programmes
6. Trans-national plans and programmes

(B) For SEA undertaken in relation to donor agencies' own processes

7. Donors' Country assistance strategies and plans
8. Donors' partnership agreements with other agencies
9. Donors' sector-specific policies
10. Donor-backed public private infrastructure support facilities and programmes

(C) For SEA in other, related circumstances

11. Independent review commissions
12. Major private sector-led projects and plans

Source: OECD DAC (2006)

The approaches to SEA applied to policies and to plans/programmes are likely to differ, with the former focusing much more on the institutional dimension (key steps are shown in Box A1.2).

Box A1.2: Key steps in SEA

SEA can be undertaken across the hierarchy of strategic decision-making levels from the policy-level to the plan and programme level, and the approach required at these different levels will vary.

(I) SEA at the policy level

Typical steps are difficult to codify or prescribe as the processes of policy-making vary considerably and, ultimately, are political. Compared to project-level EIA, SEA undertaken at the policy level demands a thorough understanding of political economy factors and institutional settings (see III below). Proponents of SEA can take advantage of windows of opportunity as leverage points for mainstreaming environment in policy processes and persuade decision-makers to use the SEA process to integrate environmental issues. In practice, there are still relatively few examples of SEAs being undertaken at this level.

(II) SEA at the plan / programme level

1. Establish context:
   - Assess the need for the SEA, set objectives, identify stakeholders and develop a communication plan.
2. Implement the SEA:
   - Collect baseline data, scope in dialogue with stakeholders, identify alternatives and their impacts, identify options for mitigation and compensation, arrange quality assurance of the assessment.
3. Inform/influence decision making:
   - Make recommendations in dialogue with stakeholders.
4. Monitor:
   - Monitor implementation and evaluate.

(III.) Addressing the institutional dimension of SEA

1. Institutional and governance assessment:
2. Review the country's environmental management and governance systems, covering:
   - Systems in place to address the environmental linkages with key policy goals and issues, particularly capacity to manage uncertain/unexpected environmental impacts or take advantage of environmental opportunities.
   - Institutions, incentives and processes that support improved governance and public and private sector engagement.
   - Environmental governance mechanisms for ensuring/reinforcing social accountability.
3. Review analytical capacity (in government, research and academic institutions, civil society organizations and private sector).
4. Gain access to decision-making – exploit opportunities to mainstream environment issues in policy formulation.
5. Institutional and governance strengthening:
   - Support mechanisms that increase social accountability and improve governance.
   - Assist countries in adaptive learning – ensuring continuity in SEA processes.

ABOUT THE OECD, DAC, AND ENVIRONET

Organisation for Economic Cooperation and Development
2 Rue Andre Pascal, 75775 Paris, France:
Tel: +33-1-4534-8200; Fax: +33-1-4430-6147; Website www.oecd.org

The OECD was founded in 1961 and its members now comprise 30 democratic nations with advanced market economies. It has active relationships with some 70 other countries, NGOs and civil society. The OECD's work covers economic and social issues from macroeconomics, to trade, education, development and science and innovation, and it is best known for its publications and its statistics. Its basic aim is to promote policies to: (a) achieve the highest sustainable economic growth and employment and a rising standard of living in member countries, while maintaining financial stability; (b) contribute to sound economic expansion in all countries; and (c) contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The OECD Development Assistance Committee (DAC) (www.oecd.org/dac) is one of the key forums in which the major bilateral donors work together to increase the effectiveness of their common efforts to support sustainable development. The Committee holds an annual *High Level Meeting* in which participants are ministers or heads of aid agencies. Much of the detailed work is undertaken through subject-specific working parties and networks such as ENVIRONET (the DAC Network on environment and development cooperation). The work of the DAC is supported by the *Development Co-operation Directorate*, (DCD), one of some dozen directorates in the OECD. The DCD is often referred to as the DAC Secretariat because of this key function.

DAC members are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Portugal, Norway, Spain, Sweden, Switzerland, United Kingdom, United States, and Commission of the European Communities. The International Monetary Fund (IMF), the United Nations Development Programme (UNDP), and the World Bank participate in the work of the DAC as observers.

The ENVIRONET

The DAC Network on Environment and Development Co-operation (ENVIRONET) focuses on environmental issues at the interface of development co-operation and environment. Its mandate is to:

- contribute to the formulation of coherent approaches to sustainable development in the context of the OECD cross-sectoral approach to sustainable development;

- Formulate specific guidance for development co-operation efforts in support of environment and sustainable development; and provide its members with a policy forum for sharing experience and disseminating good practice with regard to the integration of environmental concerns in development co-operation.