



## Convention on Biological Diversity

Distr.  
GENERAL

CBD/SBSTTA/21/INF/13  
24 November 2017

ENGLISH ONLY

SUBSIDIARY BODY ON SCIENTIFIC,  
TECHNICAL AND TECHNOLOGICAL ADVICE

Twenty-first meeting

Montreal, Canada, 11-14 December 2017

Item 6 of the provisional agenda\*

### GLOBAL STATE OF THE APPLICATION OF BIODIVERSITY-INCLUSIVE IMPACT ASSESSMENT

*Note by the Executive Secretary*

1. In decision XIII/3, paragraph 18(c), the Conference of the Parties “invites Parties and other Governments, in collaboration with relevant national and international organizations and initiatives, and within their national capacity, *as appropriate and in accordance with national legislation*” “*to take measures to improve the effectiveness of environmental impact assessments and strategic environmental assessments, including by strengthening the application of strategic environmental assessment methodologies, by using tools to evaluate potential impacts on biodiversity and ecosystem functions and services, including on resilience*”. In the same decision, the Conference of the Parties urged Parties, “*when implementing the 2030 Agenda for Sustainable Development, to mainstream biodiversity in the implementation of all relevant Sustainable Development Goals, thus promoting linkages between efforts to implement national biodiversity strategies and action plans and Sustainable Development Goal strategies and plans,*” and also requested the Executive Secretary to continue to engage in the 2030 Agenda processes (paras. 14 and 103).

2. Further, in the same decision, the Conference of the Parties called for the issues of mainstreaming of biodiversity into sectors including energy and mining, infrastructure, and manufacturing and processing to be discussed at its fourteenth meeting (paragraph 103). Environmental assessment policies and tools are highly relevant to addressing potential impacts on biodiversity from these sectors, as well as for the 2030 Agenda and Sustainable Development Goals. In order to support these decisions, and thanks to the financial support from the European Union, the Executive Secretary commissioned an independent study on the application of biodiversity-inclusive impact assessments, in particular the Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment contained in decision VIII/28. The study has reviewed available relevant literature and recent developments, including the recently approved World Bank Environmental and Social Framework. It concluded that more attention should be paid to impact assessment in the consideration of the sectoral and cross-sectoral mainstreaming of biodiversity as enshrined in decision XIII/3, in particular in the consideration of the mainstreaming of biodiversity into infrastructure, energy and mining, health, and manufacturing and processing industries at the fourteenth meeting of the Conference of the Parties.

3. The Executive Secretary is circulating herewith, for the information of participants in the twenty-first meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, a document entitled “Global state of the application of biodiversity-inclusive impact assessments”, as it was received by the Secretariat.

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\* CBD/SBSTTA/21/1.

# Global state of the application of biodiversity-inclusive impact assessments

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Date: 22/11/2017

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## Executive summary

**Introduction.** At the eighth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 8), in 2006, Parties endorsed the Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment. Ten years after their adoption, it is timely to analyse the extent of their application and to identify remaining challenges and further opportunities for the wider application of the Voluntary Guidelines as well as other relevant biodiversity-inclusive impact assessment tools.

**Scope.** “Biodiversity-inclusive” in this report will address both biodiversity in a narrow (i.e. ecosystems, species and genetic diversity) and a broad sense, including the consideration of ecosystem functions and services. There seems to be a persistent gap in the use of the terms “biodiversity” and “ecosystem services”, with limited analytical understanding or clarity on how the former underpins the latter.

**Approach.** This inventory is not a quantitative inventory of all countries that may have adopted and adapted the Voluntary Guidelines. Time and means were not available to make inquiries with all Parties to the Convention. As a proxy, the report provides an overview of recent formal literature, supplemented with unpublished documents and interviews with a number of practitioners from the network of members of the International Association for Impact Assessment (IAIA). A number of cases and country-specific examples appear in boxes throughout the text.

The number of initiatives and publications related to biodiversity, ecosystem services and natural capital has increased significantly over the last decade. This document focusses on initiatives that make concrete reference to impact assessment, defined as studies undertaken prior to formal decision-making. This includes Environmental Impact Assessment (EIA) for projects and Strategic Environmental Assessment (SEA) for policies, plans and programmes.

A preliminary version of this report was presented and discussed at the IAIA 2017 conference in Montreal. Comments and suggestions from the audience were included in this final version.

**Material reviewed: books.** There are only three academic text books on biodiversity in impact assessment, published in 1999 (Treweek, focused on EIA), 2010 (Slootweg et al., providing the background to the CBD Voluntary Guidelines) and 2016 (Geneletti, providing the most recent state of the art). The books give in-depth insights in the development of thinking on biodiversity, on impact assessment, and on how to deal with biodiversity in impact assessment.

**Material reviewed: requirements/guidelines/guidance documents.** Some 30 guidelines or guidance documents from multilateral development banks (such as IFC, WB, ADB, IADB), national and supranational authorities (such as OECD, EU, UNEP, national authorities), sectors (oil and gas, minerals and mining), IAIA, and others (TEEB, WRI, NCP) are presented and analysed.

**Analysis and conclusions.** Virtually all guidance documents published after 2006 make reference to the Voluntary Guidelines and/or are co-produced by IAIA members that were also involved in the development of the Guidelines. The Voluntary Guidelines have directly initiated or influenced the Guidelines on Biodiversity in Impact Assessment of the Ramsar Convention, the CBD Guidelines on Biodiversity in Impact Assessment in the Marine Environment, further guidance by OECD on ecosystem services in SEA, and the TEEB Guidance for local policymakers. Even though it is difficult to single out the influence of the CBD Voluntary Guidelines from other influences, notably the

Millennium Ecosystem Assessment and the follow-up initiatives, such as TEEB, the CBD guidelines obviously have been taken into account, both in voluntary guidance documents and in regulations. As one respondent stated, they have served as a trigger for the impact assessment community to respond and to further develop sector/region/topic-specific material on impact assessment. Nevertheless, a number of documents could make stronger or more explicit links to the CBD Voluntary Guidelines or, more generally, to impact assessment as an instrument to pursue the objectives of the Convention, thus providing an entry point for tapping into the reservoir of knowledge and experience represented by the Convention and the impact assessment community.

**IFC Performance Standards.** The most far-reaching effect on impact assessments is created by the binding requirements of the safeguards of the multilateral development banks. The IFC Performance Standards (PSs) from 2012 represent the most comprehensive and coherent treatment of biodiversity in a regulatory context, closely following the CBD Voluntary Guidelines. It makes a clear distinction between biodiversity *sensu stricto* (in modified, natural and critical habitats), ecosystem services (and their link to stakeholders) and production of living natural resources (agriculture, animal husbandry, fisheries, forestry). It furthermore requires the client to identify the priority ecosystem services impacted by the project and the priority ecosystem services on which the project depends. When affected, communities should participate in the determination of priority ecosystem services. The IFC PSs have been the driving force behind the WRI guidance documents on ecosystem services in impact assessment and sector-specific documents, notably those for the oil and gas as well as the mining and minerals sectors.

**World Bank Environmental and Social Framework (ESF).** In the new World Bank Environmental and Social Framework, the overarching objectives and Environmental and Social Standard (ESS) 1 on impact assessment refer to threats to biodiversity and to ecosystem services, and ESS 4 on Community Health and Safety includes a requirement on “impacts on ecosystem services that may result in adverse health and safety risks to and impact on affected communities”, thus putting ecosystem services in a social perspective. However, the requirements of ESS 6 (on biodiversity) refer to “*vulnerable biodiversity or habitats*” and “*the differing values attached to biodiversity and habitats by project affected parties and other interested parties*”, without explicit reference to ecosystem functioning and ecosystem services.

The Good Practices for Biodiversity Inclusive Impact Assessment document produced by the Multilateral Financing Institution Biodiversity Working Group similarly introduces “*values of biodiversity*” without further explanation or an explicit reference to ecosystem services in a social issues context.

As regards the reasons for the “de-linking” of ecosystem services from biodiversity in ESS 6 and in the MFI document, interviewees refer to a lack of clear methodologies to assess ecosystem services; a lack of communication, and resulting collaboration, between “social” and “green” expert communities, including within the banks; as well as difficulties in aligning ecosystem services assessments with (bank) procedures. From this perspective, World Bank ESS 4 on health and safety provides an interesting opportunity to reframe ecosystem services from a social perspective (i.e. the benefits that people obtain from nature).

**Impact assessment practice.** In the past ten years, the field of impact assessment has seen several major developments: SEA has increasingly become an established instrument, also in developing

countries; and environmental and social impact assessment is now integrated as a standard routine by development banks and some countries. Yet, some of the shortcomings of impact assessment practise remain pertinent, namely (i) the inclination to only want to tick off - legally required - boxes; (ii) a limited or bad scoping; (iii) a sole focus on negative impacts, thus not looking at enhancement potential; (iv) more generally, little attention to genuine alternatives; (v) assessments being prepared too late for having a real impact on decision making; and (vi) capacity constraints in all its dimensions.

**Biodiversity in impact assessment practice.** There is a serious lack of overall evaluations of the effectiveness of EIA and SEA in addressing biodiversity, which hampers a comprehensive analysis. However, the available information points to certain directions:

- Impact assessment is gradually doing better in taking into account biodiversity issues; the overall quality of impact statements undertaken several years after the adoption of the CBD Voluntary Guidelines is considerably better, compared to those undertaken previously.
- However, the quality of impact statements also varies enormously. There is no clear quality difference between developing or industrialised countries, even though the latter tend to address biodiversity issues slightly better. One interviewee warned not to focus on highly publicised “brilliant” practice cases, while forgetting the invisible day-to-day reality of impact assessment on the ground.
- SEA lives up to its promises of doing a better job at the landscape level (including ecosystem services), providing more room for alternatives, and better taking into account cumulative impacts. Quality is still uneven and, in general, the relatively short track record for SEA does not provide room for comparison over time.
- Country regulations often have a narrow focus on biodiversity (i.e., species and habitat conservation).
- Donor and capacity development support contribute to the quality of impact assessment.

**Methods for ecosystem services assessment.** The last decade has seen an explosive growth of the number of approaches to assess and value ecosystem services. The ValuES Methods Navigator helps in selecting a methodology from 62 different methods, taking into account assessment purpose and context, type of methodology and connection with the policy process.<sup>1</sup> For ecosystem services assessments to be influential in impact assessment and decision making, the required level of detail may range from a simple identification of relevant ecosystem services and their stakeholders, via proxy quantitative methods of services or their values, to full-fledged economic valuation. In many instances, simpler methods were preferred while still providing sufficient information for decision making.

**Why the limited uptake of ecosystem services in practice?** Ecosystem services have been promoted as an effective concept to “translate” biodiversity into social and economic concepts and the associated language, arguably better understandable for planners, decision makers and the public at large. Yet, the concept has only very slowly been adopted in practice. Based on a significant number of publications and case material, three root causes can be distinguished for the limited uptake:

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<sup>1</sup> See [www.aboutvalues.net/](http://www.aboutvalues.net/).

- **Unwillingness.** Powerful investors or sectors want to see their investments or plans realised. In many countries impact assessment is one of the few established instruments to enhance transparency and to take into account the views and concerns of the “voiceless” in society. Thus, it is not the quality of the instrument as such – even though, for a variety of reasons, poor assessments do occur – but rather the “power play” around the impact assessment instrument, aimed at minimising its influence, which lead to its limited uptake. From this perspective, impact assessment remains critical to recognise the values of ecosystem services for communities, and it should be supported through the empowerment civil society organizations (including the press), capacity building exercises, and the promotion of its more effective use.
- **Silo thinking.** Ecosystem services have appeared in thousands of scientific publications and in hundreds of valuation studies. These studies are commissioned by, and typically aimed at, green sector actors and audiences, and not at audiences that govern economy and development. A common trait in many ecosystem services studies is the absence of actual planning and decision-making issues for which these ecosystem services studies have been designed. That is, these assessments have not been designed to answer specific policy, planning or decision-making questions and, consequently, may go unnoticed or may provide inappropriate information. Providing information without having identified a clear issue or problem beforehand seems to miss the point.
- **Ineffective science-policy interface.** A wealth of scientific evidence shows the value of integrating ecosystem services in impact assessment. Yet, this information does not reach the worlds of practitioners and decision makers, or they simply do not see the use of it. In order to be effectively used in decision making, information has to meet three requirements: (i) it has to be scientifically valid (credibility); (ii) it has to be socially acceptable, in the sense that it addresses stakeholder concerns in a procedurally fair manner (legitimacy); and (iii) it has to be relevant for decision makers, in the sense that the appropriate kind of information is presented within the broader policy context, at the appropriate moment in time (salience or relevance). Yet, in practice, decision makers all too often are not getting the information they need and scientists are producing information that is not used. In very simplified wording, stakeholders’ and decision makers’ readiness to accept and use information is enhanced by simpler methodologies and a balanced use of expert and local knowledge.

IPBES, a UN initiative to strengthen the science-policy interface on biodiversity and ecosystem services could be a platform to address these issues. SEA is being referred to in a recent methodological assessment document (Acosta et al., 2016).

**Emerging themes.** Contrasting the lack of IA effectiveness studies, a wealth of documentation has been produced over the last decade on a number of emerging themes:

- **Offsets.** The uptake of biodiversity offsets as a mechanism for mitigating the residual impacts of development projects on species and ecosystems has rapidly increased over recent years, with a growing number of actors including private companies stating commitments to No Net Loss (NNL) or Net Positive Impact (NPI). There is concern that offsets could undermine existing mechanisms for conserving biodiversity if developed in isolation from Environmental and Social Impact Assessment (ESIA) processes. In particular, adherence to the so-called mitigation hierarchy is considered crucial, where avoidance of impacts by alternative design, siting, technology or timing has priority over mitigation of residual impacts; only where avoidance or

mitigation is impossible, compensation and offsets come into the picture. The Business and Biodiversity Offsets Programme (BBOP) and the Cross-Sector Biodiversity Initiative have produced relevant guidance material, and this has for instance been reflected in the current ESS6 of the new World Bank Environmental and Social Framework.

- Climate change. The Paris agreement on climate change is expected to accelerate the transitioning of energy systems towards renewables, which will have a profound impact on spatial and regional planning, infrastructure development, and ecosystem management. These sectors are subject to SEA and/or EIA. There is a world to win for biodiversity by applying appropriate biodiversity-inclusive SEA and EIA to all the activities resulting from the energy transition.
- Marine environment. New developments such as off shore wind parks, carbon storage and plans for deep sea ore mining trigger activities to look into the use of impact assessment in the marine environment. CBD has adopted in 2012 the Voluntary Guidelines for Marine areas. In general, there is a need to better understand the relationship between marine habitats and the provision of ecosystem services; that is, how human pressure may reduce service flows, possibly reaching thresholds and triggering tipping points. The mobility of marine life poses methodological challenges, as does the spatial disconnect between services and beneficiaries. Understanding cumulative impacts is needed in increasingly crowded coastal zones.
- Resilience. The rapidly developing field of resilience analysis puts sustainability, planning and impact assessment in a different perspective. It stresses that the world is inherently complex and that reliable easy predictions on the future cannot be made, thus underscoring the importance of learning and adaptive management. This new field of thinking has great potential to deal with the problems the world is facing in a more comprehensive and effective manner. Yet, the resilience and impact assessment communities first have to translate the rather inaccessible academic language and models into plain language and make a start with developing practical experience in real world decision making contexts.
- Sustainable Development Goals. The 2030 Agenda for Sustainable Development sets out an ambitious framework of goals and targets to address a range of global societal challenges. Biodiversity and ecosystems feature prominently across many of the Sustainable Development Goals (SDGs) and associated targets. They contribute directly to human well-being and development priorities. Biodiversity is at the centre of many economic activities, particularly of those related to crop and livestock agriculture, forestry, and fisheries. Trade-offs between different SDGs can be expected. Pursuing economic growth without taking into account its potential negative consequences for biodiversity, ecosystem services and underprivileged groups in society is a concrete danger for the realization of the SDGs themselves. Obviously, good impact assessment at strategic and project level can contribute to the better implementation of the SDGs in their totality. Based on its three main principles, i.e. (i) good quality information, (ii) stakeholder participation, and (iii) transparent decision making, impact assessment is a tool to avoid mistakes, monitor whether consequences of new plans are according to expectations, or whether a plan needs to be adapted through adaptive management.
- Other themes. Further relevant themes include the increased recognition of ecosystem services in (SEA for) spatial planning and regional land use planning, both in developing and in developed countries, the integration of ecosystem services in urban policy and planning, the importance of biodiversity for human health and its role in health impact assessment, and initiatives to create biodiversity data repositories for impact assessment.



**Recommendations.** Based on the inventory above, a number of recommendations are provided, which could possibly guide the further work under the Convention.

- Evaluation. The discussion on biodiversity in impact assessment has moved away from describing the traditional steps in the EIA process (screening, scoping, assessment, review, monitoring), towards thematic discussions on issues such as on how the concept of ecosystem services may contribute to better impact assessment, how biodiversity offsets can be furthered while fully respecting the mitigation hierarchy, how to address biodiversity in marine impact assessment, etc. This has resulted in an apparent lack of recent evaluative studies of how biodiversity is treated in all phases of impact assessment, both in EIA and SEA.  
Recommendation: The Convention could invite Parties to carry out, and report on, evaluation studies on the effectiveness of impact assessments, undertaken at the national level, to address biodiversity (in the broad sense, based on the three objectives of the Convention), on whether the assessments contributed to “better” decision making, based on analyses on what happened after decision making, when projects or plans are being implemented. This invitation could also be extended to donors, development banks, international NGOs, and private sector organizations. The Convention Secretariat could consider developing a set of indicative guidance questions for such evaluation studies.
- In-country regulations. Where biodiversity in the last century was predominantly associated with threatened and protected species and areas (“nature conservation”) and treated in such manner in impact assessment, the introduction of the ecosystem services concept has created a broader perspective on biodiversity, potentially doing justice to all three objectives of the Convention in a more integrated manner. However, concrete implementation on the ground seems to be overall lagging, as most country regulations still represent the “nature conservation” focus, and in particular de-emphasizing non-threatened or non-protected biodiversity and ecosystem services.  
Recommendation: the Convention could invite Parties to ensure that screening and scoping procedures for impact assessment, and the associated guidance documents, better reflect the issue of non-threatened or non-protected biodiversity, by following the Voluntary Guidelines and integrate ecosystem services in such procedures and documents.
- Capacity development. The present report shows that capacity development, in combination with donor requirements and funding, enhance the quality of EIA and SEA outcomes.  
Recommendation: the Convention could invite or urge donors to support capacity development efforts for government as well as civil society organizations in the implementation of biodiversity-inclusive impact assessment, as a means to enhance good governance and to also help with implementation of the SDGs in a coordinated and balanced manner.
- Silo thinking. A major reason for the lack of uptake of the ecosystem services concept in the impact assessment community is its green connotation and the corresponding perception by other actors that this is a thing for the “green silo people”; it is not their business. As the transitioning to a more sustainable future will have to be made by actors outside the green silo, it is critical to get them involved and listen to their issues before embarking on a study.  
Recommendation: The Convention could promote collaboration and partnerships with sector representative organizations (energy, roads and infrastructure, water, etc.). In order to build or

strengthen partnerships, their language and perceptions need to be well understood. Biodiversity-inclusive impact assessment can be applied as a means to guarantee sector plans and projects are developed that address SDGs within the boundaries of social and environmental sustainability.

- Development banks. The discussion on how to best operationalize the integrative concept of ecosystem services in a world divided into sectors and silos has shown to be a difficult one. There is arguably an ongoing risk of ecosystem services being pushed aside in the context of biodiversity-related impact assessments. However, as ecosystem services are now referred to as a requirement in some of the social ESSs of the new World Bank ESF, there seems to be an opportunity to reframe ecosystem services and bring them to the fore in the operational guidance as a “bridging” concept for social experts to cast biodiversity impacts in terms of human well-being and livelihoods.

Recommendation: in its collaboration with development banks, the Convention and its secretariat could emphasize the importance of strengthening requirements and methodologies for ecosystem services assessment in impact assessment, as a way to implement the SDGs in an integrated manner, and to avoid a disconnect between conservation and development. Further guidance material could clarify the role of ecosystem services in human well-being, its linkages with the induced impacts on biodiversity and ecosystem functions, and the way in which they are measured and integrated in Environmental and Social Impact Assessment required for funded projects, including in the stages of Strategic Environmental Assessment.

- Climate change. With the ratification of the Paris agreement, there is a need to put impact assessment on the agenda as a practical and legally embedded instrument to safeguard the role of biodiversity in the energy transition.

Recommendation: The Convention and its Secretariat could take appropriate steps in promoting the consideration of impact assessment in the UNFCCC context, as a means to harness the positive role of biodiversity and ecosystems in the energy transition and in the adaptation to unavoidable climate change. The impact assessment communities, represented by IAIA, can play an important role in such promotion and pertinent follow-up, for example by providing good practice cases.

Overall recommendation for the Convention: a stronger business case needs to be made for paying more attention to impact assessment, in particular in light of the renewed strong emphasis on the sectoral and cross-sectoral mainstreaming of biodiversity as enshrined in decision XIII/3, including the decision to further consider the mainstreaming of biodiversity into infrastructure, energy and mining, health, and manufacturing and production at COP-14. Arguments for the use of impact assessments are:

- Impact assessments are legally established and enforceable in all but two countries;
- There is an obligatory public disclosure of documents and involvement of stakeholders in the assessment process, thus providing an entry point for underprivileged groups and the NGO community to voice their views and concerns, and for the press to play its role;
- They typically support transparency in decision making, thus allowing civil society to have a view on what is being decided upon;

- They provide a way to weigh the pros and cons of a proposed plan or project in relation to the SDGs, in an integrated manner.

Biodiversity-inclusive approaches to impact assessment can be introduced in the Global Platform for Business and Biodiversity, UNFCCC, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the Cross sector Biodiversity Initiative (CSBI), and the Natural Capital Coalition.

## Acknowledgements

The author wants to acknowledge the written and/or verbal contributions made by the following individuals: Andrea Athenas, Asha Rasjvanshi, Chris Enthoven, Davide Geneletti, Florence Landsberg, Jared Hardner, Jill Baker, Jo Treweek, Lori Ana Conzo, Lothar Linde, Maria Partidario, Mervin Mason, Mike Jones, Pieter Jongejans, Susie Brownlie and Ulla Mörtberg. Many thanks to the secretariat of IAIA and the organising committee of the IAIA 2017 annual conference in Montreal for providing the opportunity to organise a (last minute) workshop on this report at the conference. Remaining errors and shortcomings are the responsibility of the author.

This work was commissioned by the Secretariat of the Convention on Biological Diversity, with financial support provided by the European Union.

## 1. Introduction

Article 14 of the CBD calls for introduction of appropriate procedures requiring environmental impact assessment of proposed projects that are likely to have significant adverse effects on biodiversity, with a view to avoiding or minimizing such effects. At the eighth meeting of the Conference of the Parties to the Convention (COP-8), in 2006, Parties endorsed the **Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment**. The guidelines provide guidance on consideration of biodiversity in both project- and strategic-level impact assessments. During the last quarter of 2016, 10 years after its adoption, a global stock take has been undertaken on whether and to what extent the guidelines have been taken up in relevant impact assessment guidance and in actual impact assessment practice.

The background to this report is provided by two decisions:

- In COP Decision VIII/28 par. 8(b) the Executive Secretary is requested to *“Compile information on the experiences made by Parties, other Governments, relevant organizations and practitioners in applying the guidelines to the circumstances in which they are to be applied, and to report to a meeting of the Subsidiary Body on Scientific, Technical and Technological Advice prior to a future meeting of the Conference of the Parties at which impact assessment will be reviewed”*.
- Furthermore, in December 2016, CBD COP *“invites Parties and other Governments, in collaboration with relevant national and international organizations and initiatives, and within their national capacity, as appropriate and in accordance with national legislation” “to take measures to improve the effectiveness of environmental impact assessments and strategic environmental assessments, including by strengthening the application of strategic*

*environmental assessment methodologies, by using tools to evaluate potential impacts on biodiversity and ecosystem functions and services, including on resilience” (decision XIII/3, paragraph 18 (c))*

The present report responds to the request above, taking into account the decision from COP-13 by providing an analysis of the extent of application of, and identifies associated challenges and opportunities for, the application of the Voluntary Guidelines and other relevant biodiversity-inclusive impact assessment tools.

Having taken stock of lessons and experiences from practice, the most recent developments will be discussed, notably in relation to the new World Bank Environmental and Social Framework (2016) and the Sustainable Development Goals (2015). The report concludes by identifying a number of potential next steps the Convention and its Secretariat could undertake, in collaboration with relevant organizations and initiatives.

On April 6<sup>th</sup> the report has been discussed in a dedicated workshop at the annual conference of the International Association for Impact Assessment in Montreal. Comments and suggestion from this workshop were integrated in this document.

## **2. Approach to the inventory**

The inventory made in this study is not a quantitative inventory of all countries that possibly have adopted and adapted the Voluntary Guidelines. Time and means were not available to make inquiries with all Parties. As a proxy, an overview of recent formal literature is provided, supplemented with unpublished documents and interviews with a number of practitioners from the network of members of the International Association for Impact Assessment (IAIA). A number of cases and country-specific examples appear in boxes throughout the text.

Three scientific journals have regularly published on biodiversity in impact assessment and have been scanned for relevant articles:

- Impact Assessment and Project Appraisal (journal linked to IAIA)  
<http://www.tandfonline.com/toc/tiap20/current>
- Environmental Impact Assessment Review: in 2013 a special edition on Ecosystem Services in EIA and SEA appeared, edited by Davide Geneletti (Volume 40).  
<http://www.journals.elsevier.com/environmental-impact-assessment-review>
- Journal of Environmental Assessment Policy and Management  
<http://www.worldscientific.com/worldscinet/jeapm>

It is generally difficult to determine whether it was the Voluntary Guidelines which primarily “pushed” Parties to act on biodiversity-inclusive impact assessment, or whether, and to what extent, other international activities also played a role. At the time of adoption of the CBD Voluntary Guidelines, the influential Millennium Ecosystem Assessment process also started publishing its stream of documents, followed by the TEEB reports and other international initiatives. Nevertheless, an attempt is made to describe the extent of application by providing an overview of initiatives that have been taken since Decision VIII/28 and how they refer, or not, to the Voluntary Guidelines.

The IAIA Biodiversity Section has in the past been the driving force behind the CBD Voluntary Guidelines; the section is still actively organising conference workshops or theme forums, and producing guidance materials. Annex 1 contains a timeline with an overview of activities of the section over the past 18 years (presented at this year's IUCN World Conservation Congress in Hawaii).

The term biodiversity-inclusive is following the interpretation of biodiversity as defined by the Voluntary Guidelines. It encompasses the three levels of biodiversity as defined by the Convention (genetic, species and ecosystem diversity), and addresses the three objectives of the Convention, i.e. conservation, sustainable use, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. In order to address the linkages between the biophysical environment and society, the concept of ecosystem services is used. "Biodiversity-inclusive" is thus understood to include biodiversity *sensu stricto* as well as ecosystem services. Later in this report, we will see that there is a persisting analytical gap in the use of the terms biodiversity and ecosystem services.

There is an overwhelming amount of initiatives and publications related to biodiversity, ecosystem services, and natural capital. This is illustrated by the compilation provided in annex 2, providing the results of a quick internet search on relevant key words. The present report only covers those initiatives that make concrete reference to impact assessment; impact assessment being defined as studies undertaken prior to formal decision-making on proposed policies, plans, programmes or projects. This encompasses Environmental Impact Assessment (EIA) for proposed projects as well as Strategic Environmental Assessment (SEA) for proposed policies, plans and programmes. Depending on applicable regulations, these may have different names and formats; for example, most development banks and the corporate sector nowadays require Environmental and Social Impact Assessment (ESIA), thus addressing both the biophysical and social environments. In some cases, a separate Health Impact Assessment or Social Impact Assessment may be required; these may also be included in ESIA.

The terms Biodiversity Impact Assessment and Ecological Impact assessment still appear here and there – this against the strong advice of the majority of the impact assessment community to stick to the formal and internationally recognized EIA and SEA formats and only develop guidance on how to address specific issues within these formats, with a view to focus on the best possible implementation in practice.

SEA is a tool to assess the consequences of plans at strategic level and has always been considered a better tool to address issues at the scale of ecosystems and landscapes in an integrated manner, including its potential to better address cumulative impacts. The question whether SEA practice has lived up to this promise will be discussed in the present report.

EIA at project level still represents the bulk of environmental assessment work; here the private sector plays an important role. In this respect, it was particularly relevant to assess the influence of IFC Performance Standard 6, which constituted an important milestone in the development of associated standards.

The resilience concept has attracted considerable and increasing interest recently, but with persisting, and perhaps even increasing, differences as regards its precise meaning. In 2010, the IAIA

organised its first workshop on the application of resilience theory in impact assessment, resilience theory being the most far-reaching and innovative way of thinking about complex systems, sustainability and the future. Some steps have been made to integrate this resilience thinking into strategic environmental assessment, but up to today this largely remains an academic discussion. Other meanings of resilience include ecological (or biophysical) and engineering resilience of ecosystem and the built environment to absorb expected shocks caused by climate change. The resilience concept will be discussed.

## 3. CBD Voluntary Guidelines in Guidance Documents

### 3.1 Introduction

This section provides an overview of prominent guidelines and guidance documents that have been published since the adoption of the CBD Voluntary Guidelines. A distinction is made in the following categories:

**Books:** short overview of the few available textbooks on biodiversity in environmental assessment.

**Development Banks:** their safeguards policies are considered to be most influential as they usually are mandatory and prescriptive, and address their lending portfolios to virtually all developing countries. Documents of the International Finance Corporation, World Bank, Asian Development Bank, Inter-American Development Bank, and the overarching Multilateral Financing Institutions Biodiversity Working Group are presented.

**National and supranational authorities:** A document from Ireland is shown as an example to illustrate the complexities in a highly regulated European context. The European Union is the first authority to produce non-binding guidance on integrating biodiversity and climate change considerations into EIA. From a developing countries perspective, an example of a guidance document on SEA from India has been looked into. As regards international organizations, UNEP has produced a practitioners' guide on the integration of ecosystem services in SEA, while OECD has produced guidance on SEA and ecosystem services.

**Other guidance.** This section presents the influential publications by the TEEB (The Economy of Ecology and Biodiversity) initiative, the World Resources Institute Guidelines on ecosystem services, and the Natural Capital Coalition's natural capital protocol; it further presents a manual on social and biodiversity impact assessment for REDD+ projects.

**Sector guidance documents:** Both the mining and minerals as well as the oil and gas sectors have produced biodiversity guidance documents.

**IAIA documents.** Since the adoption of the Voluntary Guidelines IAIA has continued to produce a flow of relevant documents.

### 3.2 Books on biodiversity in environmental assessment

The first ever comprehensive book to be published on biodiversity in impact assessment was Treweek's *Ecological Impact Assessment* (1999). The focus of the book is on EIA and its internationally accepted procedural steps, written from a European conservation perspective. The decade that followed saw a continued acceptance and spread of EIA in developing countries. As of today, virtually all countries have EIA legislation. As a consequence, the biodiversity focus broadened to also include human development aspirations. For impact assessors, the challenge to address biodiversity issues in impact assessment broadened from conservation to all three of the CBD objectives: conservation, sustainable use, and the fair and equitable sharing of benefits.

The Millennium Ecosystem Assessment (MA, 2003) provided the conceptual background and the vocabulary to translate biodiversity into ecosystem services, thus allowing to link biodiversity to human stakeholders. This was reflected in the CBD Voluntary Guidelines, based on a collaborative effort between the Convention and its Secretariat, and the IAIA. In 2002 guidelines were developed for EIA fully reflecting the objectives and principles of the CBD and its ecosystem approach. As the world was also facing a rapid development of SEA the guidelines were extended to SEA in 2006, with the adoption of the Voluntary Guidelines (CBD, Decision VIII/28).

In 2010, an academic book provided all the conceptual background and case study material that had been collected in the seven years of work by members of the Biodiversity Section of IAIA: *Biodiversity in Environmental Assessment — Enhancing Ecosystem Services for Human Well-Being* (Slootweg et al., 2010). It was the logical follow-up to Treweek's pioneering work. The book was based on an anthropocentric notion of biodiversity, aimed at audiences from industrialised as well as developing countries: *"biodiversity provides constraints and opportunities for human development. Its conservation is needed to provide the same opportunities for future generations"*.

In its epilogue, the authors identified a number of topics that had not been addressed in sufficient detail and were in need of further elaboration:

- Climate change: from a biodiversity point of view, the "dichotomy" between climate change mitigation and adaptation poses a challenge as the biodiversity community sees opportunities to integrate both adaptation and mitigation by means of ecosystem based solutions.
- Stakeholder participation: even though every chapter of the book addresses stakeholder participation, it continues to merit more attention, especially in relation to the implementation of the ecosystem approach and the need to cross boundaries between silo's (i.e. between sectors, between levels of government and between public, private and civil society).
- Capacity development and institutional issues: true stakeholder involvement in planning and assessment processes requires a society with institutions which guarantee that the views of stakeholders are not disregarded. Issues that need to be addressed include access to information, equity in expressing interests, respecting human rights, and transparency (including free press).
- Biodiversity and the law: Legal protection guarantees a minimum protection but may lead to a free-for-all in the remaining areas. Non-protected biodiversity may go unnoticed in assessments. Environmental assessment has always been positioned as a tool to provide insight in all relevant consequences of human activities; "relevant" for decision making does not necessarily only means "regulated by law". The authors suggest the recognition of ecosystem services as a means to put unprotected biodiversity in the spotlight.

In 2016 the Handbook on Biodiversity and Ecosystem Services in Impact Assessment was published (Geneletti, 2016). The book is a collection of papers providing a good overview of recent developments in academic thinking on Biodiversity and Ecosystem services in impact assessment. It confirms the establishment of the ES concept in the academic debate on biodiversity in impact assessment, and to a certain extent in practice. The book has three main sections: (i) mainstreaming of biodiversity, (ii) application in different sectors, and (iii) current issues and challenges. Highlights in



the book are the use of impact assessment to address linkages between biodiversity and health, it expands the view on biodiversity to urban and marine environments, and it reports extensively on recent developments in biodiversity offsets.

### 3.3 Development banks

#### 2012. IFC Performance Standards on Environmental and Social Sustainability

([http://www.ifc.org/wps/wcm/connect/Topics\\_Ext\\_Content/IFC\\_External\\_Corporate\\_Site/IFC+Sustainability/Our+Approach/Risk+Management/Performance+Standards](http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/IFC+Sustainability/Our+Approach/Risk+Management/Performance+Standards))

The IFC standards apply to all investment and advisory clients whose projects go through IFC's initial credit review process after January 1, 2012. The IFC uses 8 performance standards (PSs); the first provides the general framework for assessment and management of environmental and social risks and impacts and applies to all projects. PSs 2 – 8 provide more detail on specific subjects such as labour and working conditions, cultural heritage, health and safety, etc. Each PS is supported by an extensive guidance note and annotated bibliography.

PS 6 deals with biodiversity conservation and sustainable management of living natural resources. It is applied to projects (i) located in modified, natural and critical habitats, (ii) that potentially impact on or are dependent on ecosystem services over which the client has direct management control or significant influence; or (iii) that include the production of living natural resources (e.g. agriculture, animal husbandry, fisheries, forestry). The assessment will consider relevant threats to biodiversity and ecosystem services, especially focussing on habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading and pollution. It will also take into account the different values attached to biodiversity and ecosystem services by affected communities and, where appropriate, other stakeholders. For natural and critical habitat, the client should consider project-related impacts across the potentially affected landscape or seascape.

Where a project is likely to adversely impact ecosystem services, the client will identify priority ecosystem services, i.e. those services on which the project will have an adverse impact, and those on which the project directly depends for its operation. Where the project has direct management control, the mitigation hierarchy has to be applied (avoidance > mitigation > compensation). Where impacts are unavoidable, the client is expected to maintain the value and functionality of priority services.

The CBD and the work undertaken by CBD and IAIA on biodiversity in impact assessment is extensively referred to. According to many professionals working on biodiversity in impact assessment, the IFC PSs are considered the best available, doing justice to all the work which has been done over the previous decade on biodiversity and ecosystem services, and reflecting well the principles and intentions of the CBD Voluntary Guidelines.

A number of ES assessments have appeared in EIAs since, with varying quality. When starting quantitative ES assessments, they were frequently simply added as a parallel process to the existing EIA process, not adding much to the available information, and definitely not taking advantage of the integrative character of ecosystem services (Rosa and Sanchez, 2015). However, ES provide a conceptual umbrella and should not become pushed into a separate assessment (Baker et al., 2013).

The challenge of such assessment is to integrate the ES analysis in such a way that it does not duplicate other analysis (Rosa and Sanchez, 2015).

If ES are used as an integrative approach to all usual activities of impact assessment, from scoping to follow up, as recommended by current practice, it could mean an opportunity to improve the impact assessment process and its outcomes. According to recent experiences at IFC, establishing close collaboration, from the onset, between the social and the environment colleagues is a slow process but also critical success factor for better results (Conzo, pers. com.)

The private sector as well as the NGO community, separate or in combination have responded to the IFC PS by developing further guidance documents. Examples are the WRI, Cross Sector Initiative, BBOP, etc. (see further down in the present report).

#### **Box 1: Good practice ESIA following IFC Performance Standards**

Two cases present a good way to address ecosystem services within a silo based approach (i.e. ES treated as one of many – often overlapping - issues to cover, and not as a framework under which all these issues find their logical place). In the second case the team has clearly made attempts to avoid double work (which is the risk of a silo-based approach). Biodiversity and ecosystem services are treated separately. The biodiversity chapter deals with conservation issues; the ES chapter with dependencies of people on ecosystem services (sustainable use and equitable sharing in CBD terms). This is a clear differentiation contributing to clarity of the ESIA recommendations.

- **Amulsar Gold Mine, Armenia**

<http://www.lydianinternational.co.uk/projects/amulsar/environmental-and-social-impact-assessment-esia>

Lydian's proposed Amulsar Gold Project comprises the extraction and processing of ore from three open pits on Amulsar Mountain, Armenia. The Project will have a life of approximately 13 years, including two years of construction. The ESIA has been undertaken in compliance with the IFC and EBRD standards. The ESIA is considered by IFC as a good example of how to assess impacts on ecosystem services. While it does not use the ecosystem services framework as an opportunity to integrate the overall assessment, with landscape, water, biodiversity, society, health, air, noise etc. being treated separately and an ecosystem services review being provided as a separate, last item, this ecosystem services review, according to WRI Documents (Landsberg et al., 2011 and 2013), provides a very good description of how people depend on their environment and how the project may affect livelihoods by changes in ES. A strong participatory approach resulted in the definition of priority ES, the assessment of expected impacts of them, and the identification of measures to avoid or mitigate these impacts. The methodology has been clearly described, and was straightforward without a need to use a complex computational framework. In conclusion, the ESIA is a good example of how an ES assessment can highlight the interests of locally affected people.

Biodiversity issues are treated separately in the ESIA report, with a focus on conservation values. Given the sensitive nature of biodiversity at Amulsar, extensive discussions have taken place between Lydian, IFC and EBRD, leading to the establishment of a biodiversity action plan.

- **Simandou mine, Guinea**

<http://www.riotinto.com/guinea/seia-13651.aspx>

The Simandou project provides access to one of the world's largest untapped, high grade iron ore resources in the world. It can sustain a mine life in excess of 40 years and has the potential to make Guinea one of the world's top iron ore exporters.

The ESIA is considered by IFC as a good example of how to assess impacts on ecosystem services. While the overall approach is similar to the previous study, the ES chapter makes explicit links to eleven other chapters with a view to avoid duplication.

The WRI approach is also followed in this document. Seventeen ES were prioritised in an initial screening while fourteen were screened out as non-priority services. Using a combination of simple quantification techniques and expert judgement, the assessment stresses the ongoing stakeholder involvement to refine the project's understanding of ecosystem services and its impacts during project implementation. Further prioritization was based on importance to beneficiaries and irreplaceability of the service. A similar exercise was undertaken on ecosystem services the mine itself depended on.

As changes in ecosystem services will affect humans, most of the mitigation measures for ecosystem service impacts fall under the Social Management Framework, which groups social mitigation measures into a number of programmes under four themes: Urban and Rural Planning; Employment Creation and Livelihoods; Community Health, Safety, and Security; and Cultural Heritage and Awareness. These themes serve to highlight linkages between mitigation measures developed for different impacts and to promote coordination of efforts during detailed mitigation design and implementation.

The existence value of biodiversity is recognised as an ecosystem service but the SEIA does not attempt to assign a rating to impacts on this service. Rather, the biodiversity assessment (chapter 12: Biodiversity) considers impacts on habitats and species that have been identified as high value. The goal of maintaining existence value is incorporated into the development of mitigation measures to avoid and minimise negative impacts on biodiversity in the area of the mine and an offset programme to achieve a net positive impact on biodiversity.

**World Bank (2016) Environmental and Social Framework. Setting Environmental and Social Standards for Investment Project Financing.**

[https://consultations.worldbank.org/Data/hub/files/consultation-template/review-and-update-world-bank-safeguard-policies/en/materials/the\\_esf\\_clean\\_final\\_for\\_public\\_disclosure\\_post\\_board\\_august\\_4.pdf](https://consultations.worldbank.org/Data/hub/files/consultation-template/review-and-update-world-bank-safeguard-policies/en/materials/the_esf_clean_final_for_public_disclosure_post_board_august_4.pdf)

On 4 August 2016, the World Bank has approved a new Environmental and Social Framework (ESF) which is expected to take effect in early 2018. It will run parallel to the existing safeguards for approximately 7 years to govern projects approved before the new ESF was effective.

The Bank's **Vision for Sustainable Development** (pp. 5-7) is based on two goals:

- Ending extreme poverty and promoting shared prosperity;

- Securing the long-term future of the planet, its people and its resources, ensuring social inclusion and limiting the economic burdens on future generations.

The Bank states *“the two goals emphasize the importance of economic growth, inclusion and sustainability – including strong concerns for equity”*.

From a Conventio perspective, it is important to note that the Bank seeks to:

- Avoid or mitigate adverse impacts to people and the environment;
- Conserve or rehabilitate biodiversity and natural habitats, and promote the efficient and equitable use of natural resources and ecosystem services;
- Address project level impacts on climate change and consider the impacts of climate change ;
- Maximize stakeholder engagement.

The Bank’s vision goes beyond “do no harm” and explicitly states that *“where the Borrower’s environmental and social assessment has identified potential development opportunities associated to the project , the Bank will discuss the feasibility to include these opportunities in the project”*. It does not state whether this applies to social, economic, or environmental development.

Last but not least the bank has the ambition *“to provide a leading example for activities outside the scope of Bank-supported projects”*.

The WB **Environmental and Social Policy for Investment Project Financing** (pp. 9-22) sets out mandatory Bank requirements in relation to projects it supports. Ten Environmental and Social Standards (ESSs) have been developed which projects are required to meet. Most relevant for the purpose of the present document are ESS1, which deals with assessment and management of risks and impacts, and ESS 6, on biodiversity conservation and sustainable management of living natural resources.

In its due diligence procedures the Bank will, inter alia, take into account (4a-iv, page 10) any material threat to the protection, conservation, maintenance and restoration of natural habitats and biodiversity; and (v) those related to ecosystem services and the use of living natural resources, such as fisheries and forests.

The Bank recognises that indigenous people (or as they may be referred to in the national context) may be particularly vulnerable to the loss of, alienation from or exploitation of their land and access to natural and cultural resources (p. 21). In recognition of this vulnerability, the Bank will require the Borrower to obtain the Free, Prior and Informed Consent (FPIC) of the affected Indigenous Peoples when such circumstances described in ESS7 are present.

### **ESS 1. Assessment and Management of Environmental and Social Risks and Impacts**

ESS 1 follows international best practice, notably by requiring:

- Integration of environmental and social impact assessment;
- Commitment to the mitigation hierarchy (avoid, minimize, mitigate, compensate / offset);
- Differentiated measures to identify the disadvantaged or vulnerable;
- Use local capacity whenever appropriate;
- Differentiation between “risks” and “impacts”;

- “...will assess, in an integrated way, all relevant direct, indirect and cumulative environmental and social risks and impacts (p. 30) In a footnote, indirect impacts are stated to be those reasonable foreseeable impacts that occur later or elsewhere, but do **not include induced impacts**”.
- Reiteration of potential impacts on (iv) any material threat to the protection, conservation, maintenance and restoration of natural habitats and biodiversity; and (v) those related to ecosystem services and the use of living natural resources, such as fisheries and forests; (p. 32) with explanatory footnote on ES.
- Environmental and Social Commitment Plan.

The remark on **induced impacts** is noteworthy. Where indirect impacts are defined as impacts caused by the project but later in time or farther removed in distance than a direct impact, the term induced impact is not defined and does not occur in the glossary. Induced impacts, such as the opening of remote areas for development by the construction of a new road, can often create more significant impacts as compared to direct impacts. Since induced impacts do not need to be assessed, this asks for a better explanation, given its potentially important implications for the scope of the assessment.

The document does not refer to strategic assessment of bank country strategies, national policies, programme funding or any overarching frameworks. Yet (on P. 33) for projects involving multiple small subprojects, that are identified, prepared and implemented during the course of the project, the Borrower will carry out appropriate environmental and social assessment of subprojects, and prepare and implement such subprojects, as follows: (a) High Risk subprojects, in accordance with the ESSs; (b) Substantial Risk, Moderate Risk and Low Risk subprojects, in accordance with national law and any requirements of the ESSs that the Bank deems relevant to such subprojects. A programme level SEA for the total investment would seem to be useful in order to be able to assess potential cumulative impacts.

SEA is recognised for three cases (p. 40) in the annex of ESS1, even though the term deviates for two:

- **Regional ESIA** examines environmental and social risks and impacts, and issues, associated with a particular strategy, policy, plan, or program, or with a series of projects, for a particular region
- **Sectoral ESIA** examines environmental and social risks and impacts, and issues, associated with a particular sector in a region or across a nation;
- **Strategic environmental and social assessment (SESA)** is a systematic examination of environmental and social risks and impacts, and issues, associated with a policy, plan or program, typically at the national level but also in smaller areas

**ESS 6. Biodiversity Conservation and Sustainable Management of Living Natural Resources** (pp. 96-104) refers to Ecosystem Services in a footnote where it stipulates that requirements related to ES are set out in ESS1. In the further elaboration of requirements in ESS6, the ES concept is not further used; reference is made to biodiversity, habitats and the values attached to these by project-affected parties and other parties. What the word “values” stand for is left open; the same applies to “other parties”.

Other ESSs are expected to have cross-cutting links to ecosystem services (think of indigenous people, cultural heritage, stakeholder involvement, pollution prevention, etc.); the term ecosystem services is mentioned in the introduction of ESS 3 (Resource efficiency and Pollution Prevention), even though without specific requirements and, in ESS 4 (Community Health and Safety) where impacts of climate change on provisioning and regulatory services are required to be assessed, “where appropriate and feasible”.

In conclusion: ESS 1 specifically requires attention to biodiversity conservation and ecosystem services for assessment and management of social and environmental risks and impacts. ESS 6 is supposed to provide further detailed requirements. Biodiversity conservation is indeed addressed, although the issue of induced impacts remains unclear. On the sustainable management of living resources, it however introduces undefined “values of biodiversity” without further explanation of whether these encompass ecosystem services or not.

ESS 2 and 3 refer to ecosystem services as a cross-cutting issue. These references may arguably provide a “social” entry point – perhaps even a more effective entry point – to address ecosystem services. Ecosystem services can generically be defined as the benefits people obtain from nature: it thus provides a bridging concept between the biophysical environment and society. While the “green” professionals may have difficulty in getting ecosystem services operationalised in the context of impact assessment, the social professionals may be able to better relate to it, as the concept is directly linked to human well-being. However, great analytical care has to be applied to the analysis, ensuring that the exploitation of ecosystem services remains within the limits of (biophysical) sustainability and a functional ecosystem. Hence, the analytical input from the “green” professionals will be indispensable.

**2013. Asian Development Bank. Environment operational directions, 2013–2020: Promoting transitions to green growth in Asia and the Pacific.**

Strategy 2020 identifies five core areas for interventions: (i) infrastructure, (ii) environment, (iii) regional cooperation and integration, (iv) finance sector development, and (v) education. In the environment theme, emphasis is placed on climate change, liveable cities, and a range of complementary and supportive actions to improve environmental governance, policies, knowledge, and management capacity. It further emphasises the need to invest in natural capital to help reverse its ongoing decline and to ensure that environmental goods and services can sustain future economic growth and wellbeing, build climate resilience, and contribute to carbon sequestration.

On valuation of ecosystem services, the document states that in cooperation with other partners and tied to innovative financing schemes, ADB can help develop tools and capacity to improve the economic valuation of ecosystem services. Support may be provided for preparing national and subnational assessments and for linking these assessments to decision-making processes. Pilot initiatives can also support the testing of ecosystem service assessments as part of strategic environmental assessments and environmental impact assessments as a means to better capture and reflect ecosystem services in strategy, program, and project design.

IIED has been commissioned by ADB to write a Guidebook on Natural Capital – a draft has been submitted but is still work in progress. ADB also works on payment for ecosystem services in Vietnam (hydropower company pays upstream communities for maintenance of forests to protect a

watershed; the biggest challenge was not the willingness of the company to pay, but the distribution of funds over the communities – Linde, pers. com.) and pilots on ecosystem services values mapping to support project design (for example on a road investment in Vietnam and agriculture/ infrastructure investments in Myanmar).

**2015. Guidance for Assessing and Managing Biodiversity Impacts and Risks in Inter-American Development Bank Supported Operations.** IDB Technical Note ; 932

The purpose of this document is to provide clients—borrowers, project sponsors, and executing agencies—of the Inter-American Development Bank with guidance, in accord with Bank safeguard policies, to address the impacts of projects and programs on biodiversity. It is a very informative document with many concrete case examples and helpful annexes.

IADB Directive B15 states that as a principle, the Bank will support convergence and harmonization efforts among the multilateral financial institutions, bilateral donors, and other private and public partners. This principle is relevant, given the 2012 release of Performance Standards on Social and Environmental Sustainability by the International Finance Corporation (IFC); its Guidance Note 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) describes good practices for assessing and managing potential project impacts on biodiversity and related ecosystem services. It also states that *the Consultant should follow international good practice for ecosystem services screening and ecosystem services review such as provided by IFC PS6 or the World Resources Institute.*

**2015. Multilateral Financing Institutions Biodiversity Working Group. Good Practices for Biodiversity Inclusive Impact Assessment and Management Planning.**

[https://publications.iadb.org/bitstream/handle/11319/7094/Good\\_Practices\\_for\\_Biodiversity\\_Inclusive\\_Impact\\_Assessment.pdf?sequence=1](https://publications.iadb.org/bitstream/handle/11319/7094/Good_Practices_for_Biodiversity_Inclusive_Impact_Assessment.pdf?sequence=1)

The document is produced under the auspices of the Multilateral Financing Institutions Biodiversity Working Group. It contains the logos of all major development banks including World Bank, IFC, Inter-American, Asian and African Development Banks, European Investment Bank and European Bank for Reconstruction and Development, and some bilateral donors.

The document focuses on species, habitat and ecosystem conservation. It does not mention ecosystem services; instead it refers to biodiversity values, without any further explanation. Given the wealth of available examples and background documents available, the absence of references to recent literature, to the CBD and IAIA Guidance, or to the developments in thinking about biodiversity-inclusive impact assessment over the last decade more generally, is noteworthy. The document is intended for the preparation of Environmental and Social Impact Assessment; yet, linkages to social aspects – for which, as mentioned earlier, ES can serve as a useful bridging concept, are lacking.

The same Working Group also produced **2015. Good Practices for the Collection of Biodiversity Baseline Data.** <http://publications.iadb.org/handle/11319/7096#sthash.xZONIPfc.dpuf>

This document is produced for corporations, lenders, regulators, and others involved in conducting Environmental and Social Impact Assessments (ESIAs). It summarizes "good practices" for biodiversity

baseline studies that support biodiversity-inclusive impact assessment and management planning in ESIA's. Compared to the above document, it provides a broader view on biodiversity and also addresses ecosystem services. However, the observation that only very recently robust project-level methodologies for conducting baseline studies on ecosystem services have been available is questionable in light of the massive efforts that have been put in this field across the globe. The document provides a list of biodiversity data repositories and a substantial annotated resources appendix. The CBD Guidelines and the work of IAIA are included.

### 3.4 National and supranational authorities

**2006.** OECD Development Assistance Committee. **Applying Strategic Environmental Assessment. Good practice guidance for development cooperation.**

<http://www.oecd.org/environment/environment-development/36451340.pdf>

This guidance document can be considered the most influential document with respect to the application of SEA in development cooperation. It is a process and methodology focussed document providing a rich source of information on the various entry points of SEA for donor agencies and partner countries. It does not pay attention to the specific contents of SEA; those are addressed in a series of advisory notes (see the next item).

**2008.** OECD Development Assistance Committee. **Strategic Environmental Assessment and Ecosystem Services.**

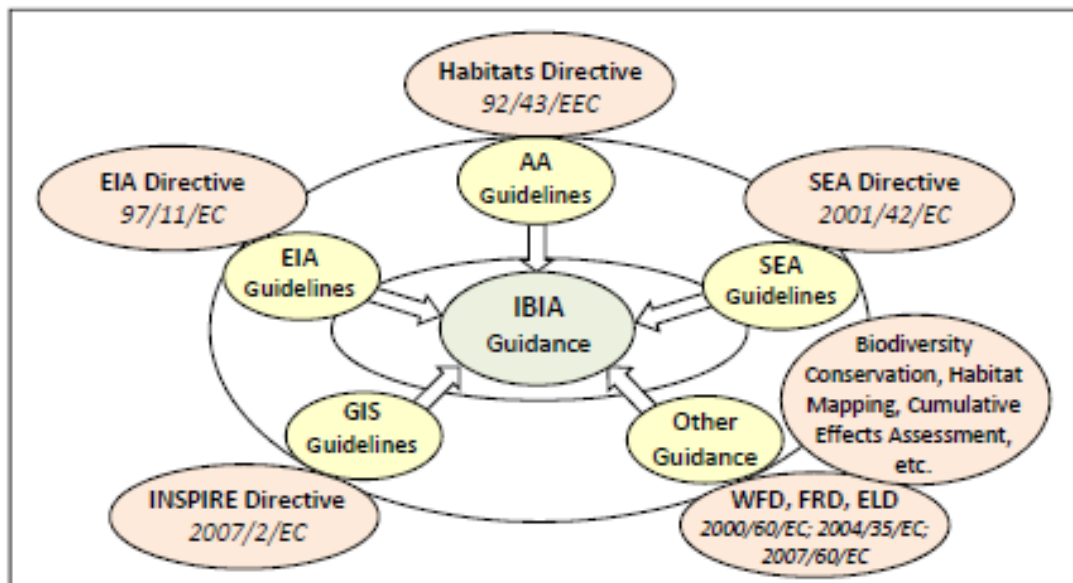
<http://www.oecd.org/dac/environment-development/41882953.pdf>

One in a series of Advisory Notes that supplement the OECD DAC Good Practice Guidance on strategic environmental assessment above. A need was recognised for more detailed advice on ecosystem services as a key emerging issue that may need to be more explicitly incorporated within SEA. The document closely follows the CBD Voluntary Guidelines, providing additional guidance and case examples.

**2010. Integrated Biodiversity Impact Assessment.** Streamlining Appropriate Assessment, SEA and EIA Processes - Best Practice Guidance. Environmental Protection Agency, Ireland

Provides a good and elaborate example of the complexity to deal with biodiversity in a regulated European context. The figure below gives an impression. Integrated biodiversity guidance has been developed to combine all procedural and contents requirements from various European Directives (EIA, SEA, appropriate assessment from the Habitats Directive, the INSPIRE directive on spatial data infrastructure, etc.). It does refer to the CBD Guidelines. Although the document provides a considerable amount of best practice information it is, due to the EU specific context, not very practical for countries outside the EU..





A similar example of a highly regulated context is provided by Olagunju and Gunn (2015) for North America, where the use of “valued ecosystem components” (VEC), as a concept somewhat similar to ecosystem services, is required in legally required cumulative effects assessment (comprehensive study for large and complex development activities).

In the subsequent analysis, no further attention is given to these highly regulated contexts as they bare little relevance for developing countries.

**Other.** Many other regional organizations and commissions have undertaken limited or more elaborate work on the use of impact assessment instruments that are linked to the work of CBD. They usually links to existing guidance documents. Examples include:

- Secretariat of the Pacific Regional Environment Programme (SPREP): (<http://www.sprep.org/index.php>) – has launched a Pacific Network for Environmental Assessment (<https://pnea.sprep.org/>). Refers to the CBD voluntary guidelines as a resource document.
- CARICOM (caricom.org) : The Caribbean Community is a grouping of twenty countries. Has developed a training module: Achieving National and Sectoral Development Priorities: Using integrated environmental assessment tools for improved MEA implementation. No specific documents on EIA or SEA.
- South Asia Co-operative Environment Programme (SACEP), an inter-governmental organization to promote and support protection, management and enhancement of the environment in the region ( [www.sacep.org](http://www.sacep.org)). Association of Southeast Asian Nations (ASEAN) (asean.org)
- Amazon Cooperation Treaty Organization (ACTO): an Intergovernmental Organization formed by eight Member Countries, encouraging sustainable development and social inclusion in the region.

**2013. European Union. Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.**

<http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>

First document explicitly linking climate change and biodiversity as topics that need to be taken into account in conjunction in impact assessment. It has all the relevant language on the long-term perspectives, need for an integrated approach, taking into account the resilience of systems, etc. It does provide extensive links to further sources of information, including data repositories, online digital datasets, and a bibliography (including the CBD Voluntary Guidelines).

**2014.** Geneletti, D. **Integrating Ecosystem Services in Strategic Environmental Assessment: A guide for practitioners.** UNEP Project for Ecosystem Services.

<http://www.ing.unitn.it/~genelab/documents/GuidelineESintoSEA.pdf>

Guide following best international practise on steps in SEA. Positions itself as an add-on to existing SEA procedures, specifically focussed on situations where proposed plans either depend on, or impact upon ecosystem services. Clearly structured according to a number of steps familiar to people working with SEA. Bibliography includes CBD Voluntary Guidelines. Recent thinking on effective use of SEA as a strategic tool for a real transition towards sustainability emphasizes the use of SEA in a more pro-active manner, in order to identify opportunities and constraints for development based on an ecosystem services assessment in a geographically defined area. This element does not seem to be reflected. .

**2015.** Wildlife Institute of India, Dehradun, India. **Strategic Environmental Assessment: A guidance tool for mainstreaming biodiversity and sustainability in development planning.**

The purpose of this manual is to encourage the use of Strategic Environmental Assessment (SEA) approaches in planning and programme development processes in countries that are currently lacking the use of this tool in decision making. It is consistent with the CBD Voluntary Guidelines.

**2016.** **Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife.** Wildlife Institute of India, Dehradun, India.

<http://www.moef.nic.in/sites/default/files/Inviting%20commnets%20%26%20suggestions.pdf>

Manual to assist in the design of wildlife friendly mitigation measures for roads and powerline projects.

### 3.5 Other Guidance Documents

**2011.** Richards, M. and Panfil, S.N. **Social and Biodiversity Impact Assessment (SBIA) Manual for REDD+ Projects: Part 1 – Core Guidance for Project Proponents.** Climate, Community and Biodiversity Alliance, Forest Trends, Fauna and Flora International, and Rainforest Alliance. Washington, DC.

Written to help those who are responsible for the design and implementation of land-based carbon projects to monitor the ways in which their projects affect the local biodiversity and the livelihoods

of the people living in and around a project site, as recognized in the Safeguards agreed at the 2010 UNFCCC meeting in Cancun.

The document links to the IAIA Best Practice principles but does not refer to existing formal in-country EIA or SEA regulations and obligations, nor to the CBD work on impact assessment and the wealth of experience on effectiveness of impact assessment, for example on the use of alternatives, the mitigation hierarchy, formal and informal public participation, integration of environmental and social impact assessment, etc. The observation of a limited track record of carbon sequestration projects and the need for further guidance is valid.

**2012. The Economics of Ecosystems and Biodiversity in Local and Regional Policy and Management.**

<http://www.teebweb.org/publication/teeb-for-local-and-regional-policy-makers-2/>

While TEEB has overall paid comparatively little attention, in its recommendations, to impact assessment as an implementation tool, IA is addressed in the volume for local and regional policy and management (TEEB, 2012). The dedicated chapter on spatial planning and environmental assessments closely follows the Voluntary Guidelines (same author involved) and makes reference to the relevant documents, including the adapted version adopted by the Ramsar Wetlands Convention.

**2013: Weaving Ecosystem Services into Impact Assessment - A Step-by-Step Method** by Florence Landsberg, Mercedes Stickler, Norbert Henninger, Jo Treweek and Orlando Venn. World Resources Institute.

<http://www.wri.org/publication/weaving-ecosystem-services-into-impact-assessment>

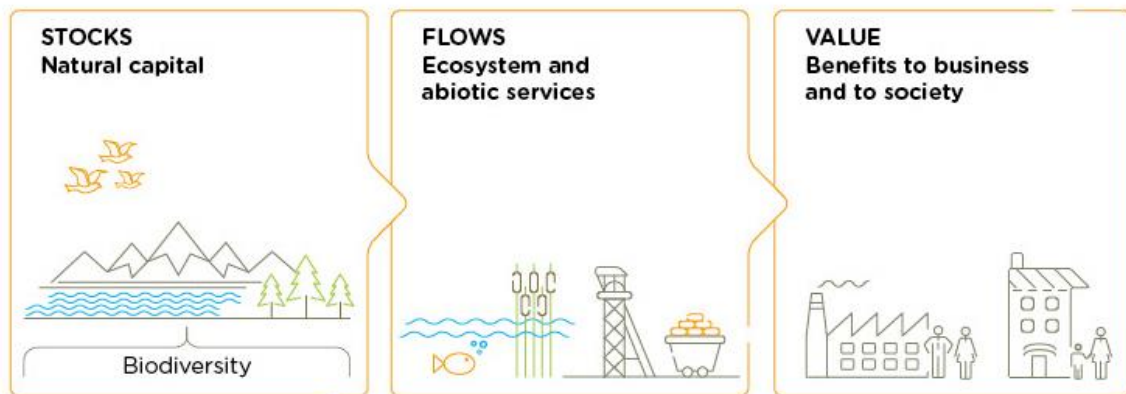
Influential document by one of the world leading international environmental NGOs, preceded by **Ecosystem Services Review for Impact Assessment: Introduction and Guide to Scoping a conceptual paper** (Landsberg et al, 2011). Provides extensive guidance for the private sector to respond to the need to identify and plan for impacts on ecosystem services by the International Finance Corporation's (IFC) performance standards. Going a step beyond project impacts, the IFC also requires consideration of a project's dependence on ecosystem services. Just as development projects can jeopardize the benefits that flow from ecosystem services, changes in ecosystems can endanger project outcomes. The document does not refer to the relevant CBD and IAIA documents.

The document does not provide a methodology to describe the supply side of the environment in terms of opportunities and constraints for development. When planning for new developments such inventory can provide the boundaries within which resources can be sustainably exploited (IAIA 2016 presentation by M. Mason and A. Dower).

**2016. The Natural Capital protocol.** <http://naturalcapitalcoalition.org/protocol/>

The Natural Capital Coalition is a global multi-stakeholder collaboration that brings together leading global initiatives and organizations to harmonize approaches to natural capital. The coalition is made up of organizations from research, science, academia, business, advisory, membership, accountancy, reporting, standard setting, finance, investment, policy, government, conservation and civil society. Natural capital is another term for the stock of renewable and non-renewable resources (e.g. plants,

animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.



The Natural Capital Protocol is a framework designed to help generate trusted, credible, and actionable information for business managers to inform decisions. The Protocol aims to support better decisions by including how we interact with nature, or more specifically natural capital. The framework does not want to explicitly promote specific tools, methodologies or approaches.

It refers to Environmental and Social Impact Assessment only once as one of the business processes that could leverage natural capital assessments, without any further references. No reference to the objectives of the Convention or to equity and the concept of sustainable use

### 3.6 Sector guidance documents

**The Energy and Biodiversity Initiative (EBI)** was one of the earliest examples to develop and promote practices for integrating biodiversity conservation into upstream oil and gas development. The Initiative brought together leading energy companies and conservation organizations to develop best practices in the oil and gas industry for biodiversity conservation. Their document was published in 2003 ([www.theebi.org](http://www.theebi.org)). Due to early collaboration with some members of IAIA it already contained a notion of the later CBD Voluntary Guidelines. The initiative ceased to exist in 2007 even though the documents are still available.

In 2006 the International Council on Mining and Minerals published its **Good practice guidance for mining and biodiversity**. It made extensive reference to the earlier EBI documents, but expanded its resource base with the millennium assessment and made reference to people being dependent on biodiversity and the need to involve stakeholders. <https://www.cbd.int/development/doc/Minining-and-Biodiversity.pdf>

**2016.** IPIECA, the global oil and gas industry association for environmental and social issues, in collaboration with The International Association of Oil and Gas Producers (IOGP) launched their **“Biodiversity and ecosystem services fundamentals”** guidance document. The report brings together information that is essential to developing BES issue management strategies for each key stage of a project’s life cycle. Guidance is structured around six inter-related management practices

applicable throughout a project, including the exploration, development, operational, decommissioning and retirement phases. The document extensively refers to earlier work, including the CBD Voluntary Guidelines. Many case examples are used to illustrate chapters.

<http://www.iogp.org/pubs/554.pdf>

### 3.7 IAIA Documents

The Capacity Building on Biodiversity in Impact Assessment programme (CBBIA) resulted in two guidance documents:

- 2006. **Guidance Document on Biodiversity, Impact Assessment and Decision Making in Southern Africa**. Susie Brownlie, Bryony Walmsley and Peter Tarr.  
<http://biodiversityadvisor.sanbi.org/wp-content/uploads/2012/08/CBBIA-IAIA-Guidance-Documents-on-Biodiversity-Impact-Assessment-and-Decision-making-in-SA.pdf>
- 2007. **Best practise guidance for biodiversity-inclusive impact assessment . A manual for practitioners and reviewers in South Asia**. Asha Rajvanshi, Vinod B. Mathur and Usman A. Iftikhar.  
[http://people.exeter.ac.uk/rwfm201/cbbia/downloads/asi/Manual\\_Guidance\\_final.pdf](http://people.exeter.ac.uk/rwfm201/cbbia/downloads/asi/Manual_Guidance_final.pdf)

Both documents provide a wealth of information and references relevant to the region. CBD Convention texts, voluntary guidelines and the Millennium Assessment are being referred to. Some 100,000 copies of the South Asia document have been distributed over the region (Rajvanshi, pers. com.).

**Best Practice Principles:** The international best practice principles series covers a variety of impact assessment topical areas, sharing best practices for practitioners. Two are directly related to biodiversity; all others are relevant (e.g. on EIA, SEA, SIA, public participation, indigenous people, etc.)

**2005.** IAIA Biodiversity Section. **Biodiversity in Impact assessment**. IAIA Best Practice Principles Series No. 3. (4 pp) <http://www.iaia.org/best-practice.php> . Update is expected early 2017.

Biodiversity matters to everyone. Its loss impoverishes the environment and reduces its capacity to support people now and in the future. Impact assessment can help to ensure development is compatible with the conservation and sustainable use of biodiversity.

**2011.** Cadman, M., Chavan, V., King, N., Willoughby, S., Rajvanshi, A., Mathur, V., Roberts, R., and Hirsch, T. (2011). **Publishing EIA-Related Primary Biodiversity Data: GBIF-IAIA Best Practice Guide**. IAIA Special Publication Series No. 7. (6 pp. 6).

"Publishing" biodiversity data may be defined as making biodiversity datasets publicly accessible in a standardised format, via an online access point (typically a web address, or url). This access point is recorded in a registry managed by the global biodiversity information facility (gbif). Published datasets can also be discovered and accessed via the GBIF data portal. (<http://data.gbif.org>).

**FasTips:** ultra short two-page documents with an introduction, five important things to know, five important things to do, and further reading. <http://www.iaia.org/fasttips.php>

- **2013.** Brownlie, S. et al. IAIA FasTip No. **5: Biodiversity Assessment.** Slogan: The benefits people derive from ecosystems must be sustained by conserving the biological diversity of those ecosystems.
- **2016.** Slootweg, R. et al. IAIA FasTip No. **13: Ecosystem Services in SEA for Spatial Planning.** Slogan: Ecosystem services link the biophysical environment to people's needs. Their incorporation into Strategic Environmental Assessment is critical for effective spatial planning.

**Key Citations:** the key citations series serves as a source of information about the different subfields of impact assessment, each listing a selection of readily-available publications.

<http://www.iaia.org/key-citations.php>

- **2010. IAIA Key Citations Series - Biodiversity:** The references provided are an indicative overview of the field and establish what might be regarded as the core literature. Update is planned for 2016, based on this inventory for CBD.

### 3.8 Main observations

The CBD Voluntary Guidelines are very broadly being referred to and integrated in existing guidance material. Virtually all documents appeared after 2006 make reference to the guidelines or are coproduced by IAIA members that were also involved in the development of the Voluntary Guidelines. In conclusion, and notwithstanding the very low number of hits when searching the internet for the Voluntary Guidelines (see Annex 2), the CBD guidelines obviously have been taken into account, both in voluntary guidance documents and in regulations (e.g. the IFC standards). The CBD Guidelines have, among other documents and initiatives, served as a trigger for others to respond and to further develop sector/region/topic-specific material (Rajvanshi, pers. com.), thus creating a cascade effect.

Development Banks have, roughly spoken, three ways to make sure biodiversity is addressed in its activities:

- i) **Safeguards:** all banks have a system of safeguard policies and regulations that apply to all of their loans, to avoid unacceptable project risks and impacts.
- ii) **Technical Assistance:** separately funded activities, often aimed at capacity development in client countries: the example provided in Box 2 describes the lessons from an SEA capacity development programme under the ADB with significant attention to biodiversity: the Greater Mekong Subregion (GMS) Core Environment Program.
- iii) **In-country mechanisms:** when country EIA legislation complies with the Banks safeguards, the EIA documents prepared in the country can be used for a loan agreement. An internal quality review process would then assess whether the documents comply with the safeguards.

Safeguard requirements thus are very dominant in Bank procedures and provide the minimum standards to which a loan has to comply. But, as Box 2 on the GMC-CEP shows, significant additional outputs can be obtained through technical assistance projects. This TA, however, does not represent the main thrust of the bank's activities.

#### **Box 2: SEA in the Greater Mekong Subregion**

The Greater Mekong Subregion (GMS) Core Environment Program built SEA capacity (as a pilot) both on ADB strategies as well as support countries to develop SEA legislation and implementation capacity. One of the spin-offs of this technical assistance programme is an environment investment loan into biodiversity corridors in the GMS. Ten SEAs have been carried out in the GMS region. Even though mainstreaming of environment was the overarching theme without specific mention of biodiversity, biodiversity appeared prominently in most cases.

Some lessons:

- **Sector representatives own the SEA process.** The value of SEA in making sectoral plans more sustainable is recognized by the sector-representatives (specifically energy, hydropower, tourism). SEA thus has the potential to create “environmental champions” within sector departments. This recognition took time and is largely created by hands-on experience and substantial investment in outreach. (Spatial/regional planners know less on needs and vulnerabilities of sector investments, resulting in a lack of ownership and commitment for SEA).
- **The ecosystem services concept works best with sector representatives** not familiar with biodiversity. It is a concept many experts immediately could relate to as it describes the environment in terms of “assets” they had to take into account during planning and assessment (e.g. sediment and erosion control for road construction; water supply and erosion control for hydropower; landscape values for tourism, etc.). Economic quantification of ecosystem services receives strong interest.
- **SEA enhances sustainability of plans.** There is a willingness to address biodiversity and related issues early in the planning process at a strategic level. SEA is recognized as a tool to integrate biodiversity in spatial and economic development plans. Biodiversity needs to be narrowed down to **protected nature** (legal obligation) and **ecosystem services** that support or impact on specific assets. Avoid using the term biodiversity synonymous for ecosystem services. Biodiversity is associated to “green stuff” that needs protection.
- **A formalized biodiversity map is a strong tool.** Biodiversity protection gets increased support; its value for economic diversification of countries is recognised. The availability of a formalized map with important biodiversity areas was of great influence on planning processes. The very fact that the components of a plan can be superimposed over the biodiversity map leads to the identification of very obvious and easily verifiable potential impacts of a plan.
- **Pressure on non-protected natural areas is high and increasing.** Regional planning becomes a necessity. Further elaboration of maps beyond the conservation status of biodiversity, by including key ecosystem services provide relevant information for planning processes (examples may include sources of water provision / regulatory function, drought risk maps, soil erosion / degradation risk maps for an agricultural plan, disaster risk map for an urban plan, etc.)
- **Champions are respected and followed.** International collaboration works in the sense that front runners (“champions”) can set the good examples that others are inclined to follow. Actual

implementation can only start within a national (or provincial) context, because legislation, language, social, cultural and economic differences between countries create complex conditions for supranational activities. Furthermore, having front runners implicates that the stage of advancement greatly differs between countries, hindering effective collaboration on an equal basis.

- **Public involvement creates transparency.** SEA contributes to more transparent decision making in the sense that civil society has a formal right to provide input in the SEA process, and thus contributed to more democratic procedures. There are indications that the positive SEA experiences enhance the establishment of SEA legislation in Cambodia and Lao PDR. Yet, civil society should get stronger options to monitor and scrutinize planners on how they have accounted for the inputs from the public involvement.

The most noticeable impact of the SEA programme is its sensitization effect. In practice the implementation of SEA and the plans for which SEAs have been carried out are confronted with many, often classical problems:

- There was little leverage to get the plans implemented; especially land use plans, usually residing under a weak ministry of environment, have problems being implemented due to lack of ownership and lack of understanding the value of a plan.
- Plans that are intrinsically of spatial nature – like a land use plan – make remarkably little use of (sound) spatial information and even basic spatial methods.
- Silo thinking is problematic, even though during the implementation of the programme a small shift towards a more open and collaborative attitude was noticeable.
- Follow up and monitoring during implementation is extremely weak.
- Computational models (e.g. GLOBIO, INVEST) are data demanding and usually do not cover all ecosystem services. Modellers steer study investment towards the collection of more data, instead of simplifying the methodology. Yet, planners and decision makers appreciate the availability of quantified economic information when available. Striking a good balance here is an important task for the environmental assessment experts.

Information sources: [www.gms-eoc.org](http://www.gms-eoc.org); Linde personal communication; CREM/SevS/IVM (2011)

The IFC Performance Standards from 2012 represent the most comprehensive and coherent treatment of biodiversity in a regulatory context. Performance Standard 6 on *Biodiversity conservation and sustainable management of living natural resources* makes a clear distinction between biodiversity *sensu stricto* (in modified, natural and critical habitats), ecosystem services (and their link to stakeholders) and the production of living natural resources (agriculture, animal husbandry, fisheries, forestry). Whenever a project is likely to adversely impact ecosystem services, as determined by the risks and impacts identification process, the client will conduct a systematic review to identify priority ecosystem services, i.e. those services that are impacted by the project or on which the project depends. Affected communities, where they exist, should participate in the determination of priority ecosystem services.

World Bank Environmental and Social Framework (ESF). In the new World Bank Environmental and Social Framework, the overarching objectives and Environmental and Social Standard (ESS) 1 on impact assessment refer to threats to biodiversity and to ecosystem services, and ESS 4 on



Community Health and Safety includes a requirement on “impacts on ecosystem services that may result in adverse health and safety risks to and impact on affected communities”, thus putting ecosystem services in a social perspective. However, the requirements of ESS 6 (on biodiversity) refer to “vulnerable biodiversity or habitats” and “the differing values attached to biodiversity and habitats by project affected parties and other interested parties”, without explicit reference to ecosystem functioning and ecosystem services.

The Good Practices for Biodiversity Inclusive Impact Assessment document produced by the Multilateral Financing Institution Biodiversity Working Group similarly introduces “values of biodiversity” without further explanation or an explicit reference to ecosystem services in a social issues context.

As regards the reasons for the “de-linking” of ecosystem services from biodiversity in ESS 6 and in the MFI document, interviewees refer to a lack of clear methodologies to assess ecosystem services; a lack of communication, and resulting collaboration, between “social” and “green” expert communities, including within the banks; as well as difficulties in aligning ecosystem services assessments with (bank) procedures. From this perspective, World Bank ESS 4 on health and safety provides an interesting opportunity to reframe ecosystem services from a social perspective (i.e. the benefits that people obtain from nature).

### **Sectors / business community**

Triggered by IFC’s Performance Standard 6, the oil and gas and the mining and minerals sector organizations have been active in the development of sector specific guidance documents, making reference to the CBD Voluntary Guidelines and other relevant international work (notably WRI’s documents).

On a global scale other sectors remain less visible. For the roads sector much work has been done in the early 2000s; now there seems to be a paucity in activities related to biodiversity in impact assessment.

The same applies to a certain extent to dams. The World Commission on Dams Report (2000) has been an impressive effort to put the performance of dams in perspective. Yet, biodiversity was treated in a haphazard way and lacked an overarching framework, which was only provided 5 years later by the Millennium Assessment, with the CBD Voluntary Guidelines providing further detail for impact assessment. At the moment some 1500 big dams are planned worldwide of which many in mega diversity countries. The complexity with cascade dam projects is enormous. This is addressed by Rajvanshi (2016) who proposes a cumulative impact assessment approach for basin wide assessment of mega dam projects, based on experience of the India Wildlife Institute.

The Natural Capital Protocol is produced by an important collaborative effort of the business community, NGOs, financial institutions and the Secretariat of the CBD. It refers to Environmental and Social Impact Assessment only once as one of the business processes that could leverage natural capital assessments, without any further references. It does not make reference to the objectives of the Convention; the terms “equitable” and “sustainable use” can’t even be found in the document (surprising for a protocol endorsed by CBD). Rather a missed opportunity to link to a globally agreed

upon biodiversity framework, and a missed opportunity to promote impact assessment as one of the few legally required procedures, available in all countries, to implement the protocol.

Under the CBD Global Platform on Business and Biodiversity, national, regional and sectoral Business and Biodiversity Platforms are being created all over the world, where private sector representatives collaborate on the identification of good practice, sharing of experiences, discussion of new regulations, development of tools, etc. Some of these platform explicitly address the use of impact assessment tools (e.g. the India platform) or work on innovative biodiversity offset mechanisms for compensation. Others do not address impact assessment at all. These platforms appear to be suitable mechanisms to do promotional work on biodiversity-inclusive impact assessment.

The REDD+ guidance is initiated by the climate change community and is relevant for those responsible for land-based carbon projects. It would benefit from a closer collaboration with the impact assessment community, in order to benefit from existing EIA or SEA regulations, including the use of alternatives, application of the mitigation hierarchy, and public participation.

## 4. Biodiversity impact assessment practice

Having documented the influence of the CBD Voluntary Guidelines on the stream of regulatory and voluntary guidelines and guidance documents, the proof of the pudding is of course in the eating: how does impact assessment deal with biodiversity in practice? Before answering this question the general developments in SEA and EIA over the last decade are provided in section 4.1. Section 4.2 provides more detail on how EIAs and SEAs are doing in practice with respect to biodiversity. A serious lack of overall evaluations of the effectiveness of EIA and SEA in addressing biodiversity hampers such analysis, but yet the available information allows for some general statements. Contrary to the lack of IA effectiveness studies, a wealth of documentation has been produced over the last decade on a number of emerging themes. These are dealt with in consecutive sections: ecosystem services, climate change, marine environment, resilience, sustainable development goals, and finalising with a wrap up with several other upcoming issues.

### 4.1 SEA and EIA in general

To get a feel of what has happened in the world of EIA and SEA over the last decade, the general developments are described in a nutshell below. At the moment of the adoption of the voluntary guidelines in 2006 the following trends were visible in the world of impact assessment (and reported on in for example CBD/SBSTTA/9/INF/18):

- After its take off in the seventies in the industrialised world, EIA for planned projects had been introduced in legislation in virtually all countries, often as a donor requirement. Implementation remains a challenge due to a variety of reasons, often linked to capacity problems, lack of commitment, or corruption.
- Strategic Environmental Assessment for policies, plans and programmes was the most recent development and in the centre of attention. The European Union had adopted a directive forcing all member states to introduce SEA; in the developing world the instrument was used sporadically; the World Bank was experimenting with SEA in some of its lending programmes. SEA largely followed the steps typical to EIA.
- Integration was a buzz word; everything had to be integrated, but it remained largely unclear what kind of integration was referred to: integration of impact assessment in the planning cycle, integration of different sector perspectives, integration of expert and stakeholder perspectives, integration of assessment tools, etc.
- Increasing evidence that biodiversity was badly addressed in impact assessment practice.
- The Millennium Ecosystem Assessment very prominently introduced the concept of ecosystem services setting a standard for terminology. These were adopted in the CBD Voluntary Guidelines.

Exactly one decade later the world of impact assessment has changed significantly in some aspects, although some of the old issues remain

- Climate change has entered the debate with full force. The recent adoption of the Paris agreement will definitely put the debate in higher gear. The impact assessment community is presently struggling to properly address a series of new issues: adaptation, mitigation, resilience, disaster risk reduction, ecosystem based mitigation and adaptation, adaptive management, etc. The need for longer time horizons for assessment is being stressed in relation to this issue.
- Environmental and Social Impact Assessment (ESIA) is a commonly established procedure in development banks for both public and corporate funding. In this respect one aspect of integration has been successfully implemented. At national level EIA and SEA remain the main instruments, with in some countries an additional requirement for Social Impact Assessment (SIA) and/or Health Impact Assessment (HIA).
- SEA is getting established around the world and is now applied in some 90 countries. Evidence suggests that voluntary practice and donor driven impact assessments are favouring the uptake of SEA as a robust planning support tool. A more recent driver for SEA application is the need to mainstream disaster risk reduction into development policies and plans (Saxena et al., 2016; Herron, pers. com.).
- SEA does not yet live up to its promises and is not used to its full potential. A survey by Lobos and Partidario (2014) revealed that practice changes very slowly compared to the advances in theoretical development. Causes can be found in resistance to change in the practitioners community and the complexity of many planning and decision making processes. Partidario stresses the need to recognise that planning processes are not linear and can be erratic; effective SEA follows this erratic process and consequently should be very flexible and thus different from EIA. Four key aspects are important for SEA to be more effective: (i) flexibility and adaptability to deal with complex decision making processes; (ii) more focus on the process (make use of decision windows) and less so on the products; (iii) institutional and capacity support; (iv) collaborative and constructive dialogue in planning processes.
- A vast body of knowledge and experience has developed around the concept of ecosystem services: its potential as integrating framework to describe (invaluable) biodiversity in terms of services with social, ecological and economic values has been demonstrated over and over again. However, in practice there is difficulty in getting the concept out of its green silo and applied in a sectorwise organised world. Yet, an increasing body of good cases is available (to cite an influential SEA practitioner: *"I am addressing ecosystem services in everything that I do these days as a routine practice; in a recent experience an SEA influenced a plan because of the use of ecosystem services!"* - Partidario, pers. com.).

Some issues were pertinent 10 years ago and still are today:

- Some of the shortcomings of impact assessment practise remain pertinent: the inclination to only want to tick off - legally required - boxes; limited or bad scoping; sole focus on negative impacts not looking at enhancement potential; little attention to genuine alternatives; too late in the decision making process, leaving little room for meaningful alternatives. These issues are well-known and have already been presented and discussed in relation to biodiversity a long time ago in CBD (2003).
- Capacity problems in terms of manpower, funding, and institutions. Impact assessment normally resides under the ministry of environment, in most countries one of the weaker

departments. Even though the actual implementation of impact assessment is a task for the project proponent, the quality control of the entire process is a task for the ministry. Capacity problems are common for the review of scoping documents and impact statements; enforcement of follow up measures required by the environmental management plan remains one of weakest parts of the process.

- Always more data needed / or fear of taking a decision? Impact assessment, being an assessment of potential future conditions, is designed for decision making in situations with incomplete information. Yet, decision makers and assessors keep on asking for more quantitative information and more certainty, making the assessment process unwieldy, unnecessary time consuming, and often resulting in quantitative predictions with low reliability. More effective use of precautionary principle, monitoring and learning during implementation, and adaptive management can make a great difference, but is not common practice yet (see section on resilience thinking).
- Silo thinking: different languages, cultures, attitudes between sector representatives hinders effective collaboration and exchange of information (see section on silo thinking).

## 4.2 Biodiversity in EIA and SEA practice

### Situation before the CBD Voluntary Guidelines

Based on a number of evaluative studies on the integration of biodiversity aspects into the various phases of environmental impact assessment, carried out between 2000 and 2006, Rajvanshi et al (2010b) provided an overview of deficiencies in EIA studies:

- Low priority for biodiversity and limited capacity to carry out the assessments;
- Lack of formalised procedures and inconsistency in methodologies;
- A lack of full treatment of biodiversity, overlooking the three levels of diversity and not addressing ecological processes at landscape scale;
- Concentration of assessments on protected species and habitats, not including assessment of impacts on ecosystems (let alone ecosystem services, a concept not widely known at the time);
- Geographically poorly defined study areas or a priori delimitation of study area not taking into account area of impact;
- A limited attention for positive planning and possibilities of biodiversity enhancement;
- Consideration of concerns from affected communities and other resource users;
- Lack of (requirements for) post-project monitoring.

For SEA such overview did not exist at all in those days, which led Sloomweg (2010b) to conclude that biodiversity in SEA is a completely new field of expertise.

### Situation after the Guidelines

Based on 20 review criteria derived from literature and the CBD Voluntary Guidelines, Seebun et al (2011) scored fifty EIA and SEA reports with regard to their effectiveness in addressing biodiversity and ecosystem services, including their influence on subsequent decision making. Half of the studies

were from before the date of the CBD Voluntary Guidelines; the other half had been produced at least two years after the adoption of the Guidelines. The impact assessment studies related to infrastructure, land use, mining, tourism, transport and energy<sup>2</sup>.

Some findings of the report are provided below, further supported with, or contradicted by, information from other studies:

- The 20 EAs from 2008-2011 scored considerably better compared to 21 EAs from 2002-2007, showing an improvement in the way that biodiversity is being addressed. This is supported by Karlson et al. (2014) who reported significant improvements in impact assessment for road projects between 2005 and 2013; yet, problems remained in how to deal with fragmentation and the scale of ecological processes (landscape). An inventory of 22 EIA reports in India, using the CBD Voluntary Guidelines as a reference, provides a strong contrast: in most of the EIA studies biodiversity experts were not even included in the EIA study team (Khera and Kumar, 2010).
- Biodiversity was addressed within all EAs and all the EAs included mitigation, monitoring, and management plans, in some cases with a biodiversity action plan; this suggests that EA professionals are routinely streamlining biodiversity and ecosystem considerations within the EA process.
- Slightly more than half of the EAs made use of tools like GISs and economic valuation of ecosystem services, enabling quantification of impacts.
- In three out of four EA reports, biodiversity was approached from the ecosystem perspective and not merely as impact on the flora and fauna within the development area; 64% of reports linked the impact on ecosystems to the impact on ecosystem services.
- Six out of every ten EAs did a cumulative impact assessment. In contrast, the India study (Khera and Kumar, 2010) revealed that most EIAs treated biodiversity in a limited manner: indirect, secondary and cumulative impacts were largely missing.
- All EAs proposed mitigation and monitoring measures for biodiversity impacts. (The extent to which these measures are being implemented and monitored has not been studied in this desk review). In the India study mitigation was only well-addressed at the species level (Kera and Kumar, 2010).
- The findings indicate that about one-third of the EAs have been able to positively influence the decision and development planning process in order to minimise impact on biodiversity and ecosystem services.
- Country legislative frameworks were found to be deficient on biodiversity issues, influencing the quality of EAs. In most cases legislation governing the EA process and biodiversity is geared toward the protection of endangered species and designated conservation sites. EAs also having to follow donor requirements (such as Bank Safeguards) scored better on the biodiversity criteria.

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<sup>2</sup> During the IAIA workshop a request from the audience was to provide criteria for quality review of impact assessment statements in order to determine in an objective manner how biodiversity issues have been addressed. There is no commonly agreed upon set of indicators. Therefore annex 3 to this report provides the review criteria, methodology for scoring and references as used by Seebun et al., as an example of a possible approach to quality review.

- The focus of attention is shifting from a site-based approach for the conservation of selected habitats and species, to the maintenance of biodiversity, functioning ecosystems and the interactions with human populations.
- The study confirmed that while both EIA and SEA can effectively integrate biodiversity considerations into the development process, SEA is getting better scores as it is less hampered by the narrow spatial and temporal frame of EIA. SEA can indeed assess impact at the strategic level, and assess indirect and cumulative impact on a longer term.
- There is significant variation in the extent to which biodiversity is being addressed. Scores of EAs in developing countries ranged between 0.1 and 0.9; in industrialised countries between 0.3 and 0.85. When looking in more detail it appears that the three highest scoring EAs come from Namibia and South Africa, countries with strong biodiversity interests and a renowned biodiversity expert community. The lowest scoring EAs come from all continents. EAs from industrialised countries tend to score somewhat higher. The findings show that generalizations for developing or industrialised countries are difficult to make; the difference between the two groups of countries falls within the range of good and bad EAs.

From East Africa comes a cry from the field where *“there is little understanding of how to effectively use impact assessment in project development to inform design of infrastructure in a way to ensure that impacts on ecosystems and biodiversity are avoided, minimized, or mitigated”* (Athenas, pers. com.). Impact assessments are often a rubber-stamping process coming too late to influence design, and not allowing for substantive contributions from stakeholders into the decision making process, though there is evidence that this can change where interested parties are organized and proactive. There still is a need to move “up stream” to strategic environmental assessment processes, but there is limited capacity in the relevant government ministries/agencies to lead on these processes, and thus there is an urgent need for additional support to make SEA a more widely used and useful tool. In this respect a good practice example from this region is provided by the Tana River Delta Land Use Plan and SEA in Kenya, where biodiversity concerns, ecosystem services and human interests have played a significant role in this participatory plan formulation process, supported by a number of international NGOs (Odhengo et al., 2014).

Rajvanshi (pers. com.) reports on a success story from India where effective framing of ecosystem services in a cultural context provided an entry point for discussion on the operation of a series of dams (cascade) in the Ganges River. Standard ES terminology may lead to prejudice or a defensive response. In India, the Ganges is considered a spiritual lifeline for hundreds of millions of people. The continuous flow of the river is a prerequisite to maintain this “lifeline”. Where the terms ecosystem service did not lead to response, the framing of ES in this spiritual context guaranteed attention and understanding of the issue.

In South Africa the local experience is that, despite the CBD Voluntary Guidance and other guidance, many EIAs still are weak (Brownlie, pers. com.):

- They tend to look at biodiversity in discrete silos (mammals, birds, etc) and seldom make the connections or identify interdependencies between water resources, livelihoods/ land use, etc.
- Furthermore, the more “academic” and theoretical ideas seem to have little traction in practice.

- Perhaps the biggest problem is dealing with indirect and induced impacts on biodiversity – how to predict them and compensate for them (in many instances these impacts are far worse than direct impacts, but they are generally very weakly addressed if at all).
- Trying to account for migratory species is a big challenge (especially with fluctuating populations, so much of their lifecycles beyond control).
- Another big issue is decision making for the short-term only – within the current GDP/ economic growth paradigm – with inappropriate trade-offs being made.

Biodiversity offsets have forced improvements in EIA practice in South Africa given its emphasis on measurement of impacts (i.e. away from rather woolly significance ratings). And South Africa is in the process of producing minimum requirements for good practice in addressing biodiversity in IA – these requirements will emphasize the early screening and scoping stages to push the mitigation hierarchy's preference for avoidance and prevention.

### **Concluding:**

The first obvious conclusion is that we have far too little evaluative studies on the effectiveness of EIA and SEA to address biodiversity in its full breadth (as described in the CBD Voluntary Guidelines). Parties to the Convention, but also donors and the NGO community should in this respect do more efforts and make a habit of reporting pertinent insights to the Convention.

There are signals that biodiversity is better dealt with in impact assessment practice since the appearance of the CBD Voluntary Guidelines. SEA definitely show signs of living up to its promises by doing a better job at the landscape level (including ecosystem services), providing more room for alternatives, and better taking into account cumulative impacts. However, many bad SEAs do exist. The relatively short track record for SEA does not provide room for comparison.

For EIA we have a longer track record but the picture is confusing. On the one hand, we also see signs of improvement in the way biodiversity is integrated in EIA. Biodiversity seems to be addressed in most EIAs, and the use of quantitative tools is increasing. Ecosystem services are increasingly being recognised, although many EIAs still remain focused on protected species and habitats. This is partially the result of the limited focus of national legislative frameworks; in this respect it is important to notice that donor requirements do have a positive effect on the quality of the EIAs.

A sobering remark comes from Brownlie (pers. com.) who states that “there is a tension between ‘brilliant’ practice which reaches one or two people, often in institutions or academia, and ‘getting the basics right’ and trying to reach everyone out there who’s doing the practical IA!” In other words, it is possible to find more and more good practice cases (see the experiences in the Greater Mekong Subregion (Box 2), the Zambesi Regional Land Use Plan(Box 5) or the above mentioned Tana River SEA), which very often are the result of donor support, sometimes combined with capacity development efforts. However, the quality of the bulk of impact assessment reports may remain problematic in many countries. In general the impression is we are moving into the right direction, but there is far too little quantitative evidence to make a solid statement on how far we have actually moved. The biggest unknown in this respect is the situation on monitoring and follow up: what has actually happened after approval of the projects or plans and after implementation?



## 4.3 Ecosystem services

### Assessment and valuation methods of ecosystem services

The last decade has seen an explosive growth of the number of approaches to assess and value ecosystem services. In this respect it is important not to confuse the generic term *ecosystem services assessment* with the impact assessment family. ES assessment encompasses all available methodologies to identify, describe, quantify and value ES. Impact assessment on the other hand, is a procedurally defined, legally binding process in support of decision making. ES assessment can thus provide the content for the impact assessment process.

It is impossible to provide a complete overview of methodologies; the best available source is the ValuES website: “*Methods for integrating ecosystem services into policy, planning, and practice*” ([www.aboutvalues.net](http://www.aboutvalues.net)). The site provides a *Methods Navigator* which helps in determining the type of method suitable for the study at hand; it contains 62 (!! ) different methods. An evaluative study of different approaches to valuation showed there is no one-size-fits-all-approach to assessments; it appeared that four key questions need to be answered before being able to define the appropriate method (Berghöfer et al. 2015):

Assessment purpose: Assessing ecosystem services can be done for different purposes. They range from raising general awareness to supporting specific planning or decision making. ValuES has identified 6 distinct types of applications for which different recommendations apply.

Assessment context: To assess ecosystem services meaningfully it is crucial to understand the context, i.e. the “supply side” (the ecosystem) and the “demand side” (the socio-economic, cultural and political system). This can require additional specialist knowledge, e.g. about cultural norms, legal issues and policy instruments. Understanding this context helps the analyst to ask the right assessment questions; and also the results need to be interpreted in context.

Choice of method: Different methods generate different results because they represent different perspectives or focus on different factors. This being so, assessments always shape values, even if their main aim is to measure them. For relevant and credible results, it is necessary to choose an appropriate method. This means to select an approach (e.g. qualitative, quantitative, or monetary valuation) and to strike a balance in assessment design between costs, quickness, robustness and detail of findings. More demanding methods do not per se produce more useful results.

Connection with policy process: An assessment can produce much-needed information, but doing an assessment is unlikely on its own to change policy processes or decisions. Engaging key stakeholders early on and strategically gearing the assessment to a political entry point enhances its potential policy impact. This can require significant efforts. However, in some cases, the (participatory) assessment process itself has been just as important for leveraging policy change as the assessment results.

There is no specific inventory of methods for impact assessment. However, different phases from the impact assessment process can be recognised in the ValuES Methods Navigator, such as scoping, comparison of alternatives, or calculation of compensation requirements.

In their rapid overview of ES valuations within the context of impact assessment that had concrete influence on decision making, Sloomweg and Beukering (2008) distinguished four distinct levels in methods of ecosystem services assessment:

1. Identification of ES: The simplest way of paying attention to ecosystem services is the qualitative listing of services. Recognising ecosystem services raises awareness on issues that had not been thought of before and recognises stakeholders that had been overlooked. Even this most simple ES overview is shown to be of influence on planning an decision making.
2. Quantification of ES: a service can be quantified in units of measurement directly linked to the service, such as the quantity of renewable water supply, the annual sustainably harvestable amount of fish, timber or fodder from a specific area, amount of carbon stored, number of species occurring in the area, etc. Such quantification allows, for example, for comparison of the impacts of alternative project designs. Rapid, semi-quantitative proxies are often effectively used in such comparison, for example by using a five point scale (++ , + , 0 , - , --). Stakeholders and decision makers can easily relate to such scales.
3. Societal valuation of ES: ES represent sociocultural, economic and ecological values for society that can be expressed in different terms: examples can be the number of households depending on a service (e.g. in subsistence farming), the number of jobs related to a service (e.g. in fisheries), the number of people protected against forces of nature (e.g. by coastal dunes or mangroves), the number of red-listed species in an area (red-listed being a societal expression of ecological value), the contribution that an area makes in maintaining other ecosystems (e.g. in the case of migratory fish and birds, or sediment flows in deltas), etc. In practice, this appears to be very relevant information for decision makers.
4. Economic quantification of ES values: the most data intense and complicated valuation methods applying to situations where plans are known in some more detail, often leading to an aggregate total economic value (TEV) of an ecosystem. Contains methods for market based valuation (e.g. net factor income approach), revealed preference methods (e.g. hedonic pricing, avoided damage, travel cost method, etc.), and stated preference methods (e.g. contingent valuation, choice modelling). Outcomes of such approaches are often perceived as coming from a technocratic black box (see for example Box 4 below).

From the analysis it became clear that in the context of impact assessment, especially at strategic planning level, many choices still need to be made, implying that quantitative data may not yet be available. In such cases the simpler methods (levels 1 to 3) had preference over the more complicated financial quantification methods. This is in accordance with the above findings of the ValuES project.

Another important observation of their inventory was that the majority of published ES valuation studies did not relate to any concrete planning or decision making situation. So the choice of the assessment methodology had not been defined by assessment purpose, context nor policy process as there was no concrete need for the information. The applicability of such outcomes can be questioned.

### **Box 3: Ecosystem services and infrastructure development**

*“New infrastructure is needed globally to support economic development and improve human well-being. Investments that do not consider ecosystem services (ES) can eliminate these important*

*societal benefits from nature, undermining the development benefits infrastructure is intended to provide. Such tradeoffs are acknowledged conceptually but in practice have rarely been considered in infrastructure planning. Inclusion of ES information is likely to provide the greatest development benefit in early stages of infrastructure decisions. Those strategic planning stages are typically guided by in-country processes, with Multilateral Development Banks playing a supporting role, making it critical to express the ES consequences of infrastructure development using metrics relevant to government decision makers” (Mandle et al., 2015).*

### **Reasons for limited uptake of ecosystem services in impact assessment practice**

There still is a significant gap in the understanding of how ecosystem services exactly relate to biological diversity. Research on biodiversity and ecological function has routinely “*measured functions without extending those to known services*” whereas the ecosystem services field has “*described services without understanding their underlying ecological functions*” (Cardinale et al, 2012, in Brownlie et al, 2013). In practice however, these recognized limitations do not have to hamper the effective use of the ecosystem services concept, because its real value for impact assessment lies in (IAIA, 2016):

- (i) Providing a description of the environment in understandable language (i.e., human values);
- (ii) The explicit recognition of affected groups and whether these are winners or losers of proposed measures, by making the impacts on people transparent and facilitate equitable distribution of benefits from development (Mandle and Tallis, 2016).
- (iii) The provision of a holistic framework to describe linkages between people and their environment beyond silo-and sector based approaches;
- (iv) Thus being a means to cross boundaries between sectors and actors (i.e., planners, stakeholders and decision makers); and
- (v) Identifying relevant geographic scales for negotiating trade-offs, while maintaining the integrity of ecological systems and processes.

A prerequisite is that **maintenance of biological diversity** is also recognised as a service provided by ecosystems, linked to future generations. As chapter 3 already showed, in practice this is solved by most development banks by making a distinction between biodiversity (considered a conservation issue) and ecosystem services (considered as a means to identify affected groups of stakeholders).

#### **Box 4: The ecosystem services approach in the SEA for the Zambezi land use plan (Namibia)**

Integrated land use planning and SEA was carried out for the Zambesi region in Namibia. Ecosystem services assessment was piloted in the accompanying SEA. The following lessons were reported:

##### **Field assessment:**

- ES assessment as early as possible, so that results can be used in subsequent discussions.
- Ensure ample field work.
- Coordinate the ES work with others (planners, mappers) to achieve greatest influence.
- Plan what sort of data will be gathered; express the value of ecosystem services in ways that people understand, and in quantifiable ways. So not restricted only to monetary values.
- Use maps to visualize ecosystem service users and providers. Add features relevant to ecosystem

services: location of livestock and fish markets, areas of bush encroachment; selling of woodland products, etc.

- Take photos to better explain environmental features and their link to livelihoods.
- Arrange appointments with as many local representatives of the regional economy, as possible, to dig out ES information.

#### **Compilation of ES information to influence the land use planning process**

- Present the opportunities and synergies that arise from ecosystem services
- Present alternative development scenarios that take into account the role of ecosystem services.

#### **Communication**

- If economic valuation is applied, then the methods should be understandable to non-experts.
- Express values in a variety of ways, such as livelihoods, benefits to local people, and other ways that decision makers can relate to.
- Maximise political buy-in; explain ecosystem services as a safety net for poor households (“pro-poor”).
- Make the ES information appropriate for the target audiences. Link ecosystems with livelihoods, employment and economy. Show people involved in day-to-day activities. Use headlines from newspaper articles to show how issues are relevant to local interests.
- Classification (provisioning, regulating, etc.) of ecosystem services is irrelevant for stakeholders; don’t unnecessarily complicate things.

Source: Lessons learned from Ecosystem Services Valuation for the Strategic Environmental Assessment (SEA) of the Zambezi Integrated Regional Land Use Plan, Namibia. John Pallett, Southern African Institute for Environmental Assessment at the request of the ValuES project [www.aboutvalues.net](http://www.aboutvalues.net)

Ecosystem services have been promoted as an effective concept to translate biodiversity into understandable language for planners, decision makers and the public at large (CBD, 2006; CBD Secretariat and NCEA, 2006; Partidario and Gomes, 2013; Geneletti, 2013; Baker et al., 2013). Ecosystem services may be quantified, even when we do not have complete ecological knowledge of all involved species and their roles in the delivery of a service (Slootweg et al., 2010a). In spite of these apparent advantages, the concept of ecosystem services has only very slowly been adopted in practice (Slootweg and Beukering, 2008; Baker et al, 2013; Geneletti, 2011 and 2013; Laurans et al, 2013). Honrado et al. (2013) consider it “*striking how EIA and SEA miss the opportunity of exploring how ecosystem services can improve local well-being*”. So either the concept doesn’t work or the efforts to make it work are ineffective.

In a search for the reasons why the concept of ecosystem services, supported by such vast scientific evidence, has so little uptake in the worlds of planning and environmental assessment, Slootweg (2015) distinguished three main reasons (for more detail see also Berghöfer et al, 2016):

#### **(i) Unwillingness**

In early days impact assessment was seen as an instrument to give a voice to the environment, which was considered voiceless, and to protect citizens against harmful impacts on their living environment (quality of air, water and soils). With the introduction in developing countries the instrument is also used to give a voice to the powerless in society. Biodiversity through its ecosystem services

underpins the livelihoods of millions of under-privileged people. So, a proper assessment of impacts on biodiversity also is an assessment of the impact on these groups.

Since impact assessment has to inform decision making on big investments or on plans having big consequences, it is always surrounded by power play. Powerful investors or sector departments want to see their investments or plans realised. In many countries impact assessment is the only instrument available to force these actors to be transparent on their plans and to take into account the “voiceless” in society. This is one of the main reasons why impact assessment processes are so often flawed by corruption, bad performance, too little too late reports, etc. Thus, from this perspective, it is not the quality of the instrument – even though bad quality implementation undeniably occurs – but rather the “power play” around the instrument, aimed at minimising its influence, which limits its effectiveness in practice.

There are many circumstances in which government/business explicitly do not want to know all things, or do not want it to be known in the public domain. It is “unfair” to blame impact assessment as a tool for bad decisions so often made. On the contrary, the instrument can be an instrument to recognise the value of ecosystem services for communities and should be supported through the empowerment civil society organizations (including the press), capacity building exercises, and promotion of the effective use of this universally available tool. (See for example the GEF Small Grants programme for civil society organizations (<https://sgp.undp.org/>), or Kolhoff (2016) for a detailed inventory of the performance of EIA systems in low and middle income countries).

#### **(ii) Silo thinking**

The world is organised according to sectors, each having its own educational background, its own working environment, its own language and culture – in short, its own “silo”. Where such “siloed” communities have their independent work areas, such arrangements may be effective. However, they show their limitations in an increasingly crowded and interconnected world.

Ecosystem services have appeared in thousands of scientific publications and in hundreds of valuation studies (Laurans et al., 2013). These studies are commissioned by, implemented by and aimed at green sector actors and audiences and not at audiences that govern economy and development. To have actual “real world” impact the concept should be applied in policy and planning processes in other sectors; it should be applied to all settings, be it a pristine forest or wetland, irrigated agricultural land, green or brown-fields, reclaimed land, or urban areas for that matter. People need food, water, air, space, etcetera, now and in future; these products and services are provided in varying combinations by all types of landscapes.

#### **Box 5: Biodiversity conservation as a silo**

A study on the treatment of biodiversity in SEAs for spatial plans in The Netherlands demonstrated that biodiversity typically relates to protected areas only. Conservation is the main objective of such areas; a systematic overview of potential ecosystem services was something unknown at the time, although leisure activities, flood attenuation and biodiversity conservation, ecosystem services indeed, were thought to go well together. Non-protected biodiversity went totally unnoticed. Some parts of the territory were protected for other sector interests (water infiltration areas; coastal protection areas; also ecosystem services). Sector interests dominates the management objectives of

these segregated areas. In this example of narrow silo-thinking, the green silo was allowed to have its part of the territory, as long as they didn't bother too much with the rest. (Kolhoff and Sloomweg, 2005)

A common trait in many ES studies is the absence of actual planning and decision-making issues for which these ecosystem services studies have been designed. The assessors think that showing the value of ecosystem services will automatically do the work. However, these assessments have not been designed to answer specific policy, planning or decision-making questions and may go unnoticed or may provide inappropriate information. For example, do we need to know the present level of services delivery, or the potential future delivery, or the past pre-degradation level, or do we need to know the pace of change in service delivery, over time or over space. Last but not least, do we need to know the total economic value of services or do we want to know where services delivery changes and who will be the winners and who the losers. In summary, the what / who / where / when / how questions define the type of information needed. This can hardly be predefined. So, having a solution ready, without having a clear issue or problem seems to miss the point. Much of the TEEB work, the European MAES programme (Mapping and Assessment of Ecosystems and their Services; <http://biodiversity.europa.eu/maes>), maybe the IPBES programme, and many academic valuation studies are characterised by this green silo "solution for an unknown problem" approach.

### **(iii) An ineffective science-policy interface**

As discussed above, a wealth of scientific evidence shows the value of integrating ecosystem services in impact assessment. Yet, this information doesn't reach the worlds of practitioners and decision makers, or they simply don't see the use of it. Based on Ruckelshaus et al (2013) a number of underlying causes may explain this hampered science – policy interface :

It's the process! The process in which biodiversity and ecosystem services information is embedded is at least as important as the scientific tools and outputs (content). To be used in decision making, information has to meet three requirements; it has to be scientifically valid (credible), socially accepted in the sense that it addresses stakeholder concerns in a procedurally fair manner (legitimate), and it has to be relevant for decision makers (salience) in the sense that the right kind of information is presented within the broader policy context, at the right moment in time (Cash et al., 2003 in: Sloomweg and Mollinga, 2010). In decision making context "*the recurrently experienced problem is that decision makers are not getting information that they need and scientists are producing information that is not used*". An interactive science-policy process, meaningfully involving scientists, local experts, stakeholders and decision makers, enhances the credibility, salience and legitimacy of the information (Ruckelshaus et al., 2013).

Keep it simple. Where scientists proposed to start with quantitative Tier 1 models, intending to develop more complex, detailed and data intense Tier 2 and 3 models during the study period, decision makers insisted on developing simpler Tier 0 models, based on semi-quantitative ranking methods. Ranking models allow for an iterative process to rapidly develop and compare alternatives in a transparent manner and allow stakeholders to actively engage in the debate. While in the eyes of the scientists the information may be less than optimal (credibility), the legitimacy and salience of the information is significantly enhanced thus making the obtained information more relevant for decision making.

It's not always about the money. Valuation models that provided estimates of monetary benefits were less important than anticipated (Ruckelshaus et al., 2013). For traditional market commodities decision makers are interested in monetary terms. For non-marketed services a host of non-market benefits is used. Decision makers often want to understand how alternative decisions might affect where ecosystem services are supplied and to whom; monetary value information does not provide this information. Moreover, absolute values may not be that relevant, rather it would be more feasible to assess the relative magnitude of changes across different options (Baker et al., 2013).

Involve local experts. In spite of several decades of participatory planning, action research, development cooperation lessons, and endless pleas for involvement of local experts and traditional knowledge, apparently a part of the expert community still ignores these lessons. Christie et al, 2012, report that half of the biodiversity valuation research they reviewed, failed to involve local researchers or policymakers. In everyday practice too many plan and impact studies are carried out from behind desks.

Use knowledge brokers. Reinecke et al. (2013) refer to knowledge brokers that try to bridge the gap between scientists, policy-makers, interest groups, the media and citizens. The incentives for scientists lie in innovation, developing new ideas that can be associated to their names in the scientific literature. Policymakers need more simple and generalised rules of thumb that they can use in complex decision making processes; public praise of the quality of their decision is their incentive. So, the most interesting and thought-provoking ideas for a scientist are usually a nightmare for decision makers.

The overall conclusion is similar to the lesson that many environmental assessment practitioners have learned in practice: the simpler - the better, as long as the information is of good quality, relevant to decision makers and reflects the interests of stakeholders. So, maybe forget about computational models and monetary valuation for a while and first start asking local people and local experts and listen well to the language they use.

The UN has started the IPBES initiative with one of its objectives to strengthen the science-policy interface on biodiversity and ecosystem services with regard to thematic and methodological issues. The Platform will identify policy-relevant tools and methodologies. These are expected to support the formulation and implementation of policies for the conservation and sustainable use of biodiversity. Impact assessment, one of the few legally binding instruments, is not mentioned in their work programme. However, in a recent assessment of methodologies (Acosta et al., 2016) SEA is being referred to. The initiative is relatively recent and it is too early to assess its practical applicability (Rajvanshi, pers. com.).

### **Ecosystem services and the pro-active use of SEA**

The literature is quite clear on the potential role that ecosystem services assessment can play in planning. The manner in which the concept can be conveyed to the world of planners is less clear. Of course, in a perfect world planners could adapt the concept and strive for sustainable resource exploitation. Regrettably the world isn't perfect; planning is often guided by economic motives and power play by influential sectors. This is where environmental assessment has to play its legally defined role in making sure that human development doesn't go beyond the boundaries of what an area can sustain, making sure that winners do not take all but also care for the losers, and making

sure that potential problems are not exported to other areas and people, or towards the future (Slootweg, 2015).

Many authors have suggested that SEA provides the best opportunity to integrate ecosystem services in planning (e.g. Geneletti, 2011; Viglizzo et al., 2012; Honrado et al. 2013; Barral and Oscar, 2012). SEA can play different roles. The “traditional” role of SEA is a re-active one; the planning process is in the lead and the SEA assesses the consequences of the plan (and alternatives if available). Partidario (2012) describes this as EIA-type of SEA as it resembles the typical procedural set-up of EIA for projects. She opposes this to a “strategic use” of SEA. In such an approach SEA is used to pro-actively inform the planning process. Rather than assessing the impacts of plans, the rationale for this approach is to use SEA to inform the planning process from the start towards more sustainable solutions (Partidario, 2012). This approach also helps to avoid the perception of environmental assessment being a hindrance to development.

By describing a region in terms of ecosystems and their services, a pro-active SEA can picture the supply side for a development plan. In SEA this supply of goods and services can be assessed against the demand for development, thus providing a good knowledge base to assess whether a region has the potential to facilitate human development ambitions. Opportunities and constraints for development can be identified and addressed. When used in a pro-active manner, an ecosystem services assessment can thus define options for sustainable development. As Baker et al. (2013) point out, an ecosystem services assessment should form the basic framework for a planning process. In such an approach the strengths of the ecosystem services concept can be used to its full extent.

#### 4.4 Offsets

The uptake of biodiversity offsets as a mechanism for mitigating the residual impacts of development projects on species and ecosystems has rapidly increased over recent years, with a growing number of companies stating commitments to No Net Loss (NNL) or Net Positive Impact (NPI) and national offset frameworks and policies emerging in countries including Colombia, Liberia, Mozambique and Mongolia. International guidance on best practice has been developed (e.g. the work by the Business and Biodiversity Offsets Programme (BBOP) at <http://bbop.forest-trends.org> ) and there is a growing body of scientific research particularly in relation to developing offset metrics, which can measure biodiversity losses and gains over time, as well as the ecological limits to offsetting.

The need for more practical experience is stressed; lessons learned from a community of practice will do more to further offset success than 10 years of theoretical debate. To address this need for practical learning Fauna and Flora International (<http://www.fauna-flora.org/> ) reviewed experience in offset policy and practice, focusing on three countries with established offset schemes (Australia, South Africa and the United States) alongside recent and emerging offset policy and frameworks (in Belize, Colombia, Liberia, Mongolia, Mozambique and the United Kingdom) and site-level offset and compensation projects around the world (including Brazil, Ghana, Guinea, Liberia, Madagascar, Myanmar and the United Kingdom) (Jenner and Howard, 2015).

The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people’s use and cultural values associated with biodiversity. The rapid growth has resulted in a proliferation



of methodologies: there are already well over 100 different loss-gain methods used to look at habitat and species offsets (BBOP, 2012b in: Brownlie et al, 2013).

There is concern that offsets could undermine existing mechanisms for conserving biodiversity if developed in isolation from Environmental and Social Impact Assessment (ESIA) processes. Especially adherence to the so-called mitigation hierarchy is considered crucial, where avoidance of impacts by alternative design, siting, technology or timing has priority over mitigation of residual impacts; only where avoidance or mitigation is impossible, compensation and offsets come into the picture. Legitimate concerns exist that an early focus on biodiversity offsets, rather than their use as a “last resort” diverts attention from rigorous application of the mitigation hierarchy in planning, impact assessment and decision making. Rigorous application of the mitigation hierarchy, including the design of appropriate and feasible offsets, is often undermined by an ineffective EIA process.

Several authors have been actively working on offsets within an impact assessment framework (e.g. Brownlie and Botha, 2009; Rajvanshi and Matur, 2010a, Brownlie, King and Treweek, 2013). In their recent work on offsets in impact assessment Brownlie and Treweek (2016) provide an elaborate overview how to integrate offset planning with the impact assessment process, following the biodiversity offset principles from BBOP.

Even though impact assessment is seen as the main vehicle for planning biodiversity offsets, its implementation at project level is limited to specific activities. Taking a project-by-project approach overlooks cumulative effects and efficiencies that could be exploited when looking more strategically at a landscape level. So, also here a call for biodiversity-inclusive strategic environmental assessment.

The Cross-Sector Biodiversity Initiative (CSBI) is a partnership between IPIECA - the global oil and gas industry association for environmental and social issues, the International Council on Mining and Metals (ICMM) and the Equator Principles Association to develop and share good practices related to management of biodiversity and ecosystem services in the extractive industries. The initiative supports the broader goals of innovative and transparent application of the mitigation hierarchy in relation to biodiversity and ecosystem services, as defined in the International Finance Corporation (IFC) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (2012). Their webpage presents various guidance documents, among others on applying the mitigation hierarchy in impact assessment (see Ekstrom, 2012).

EIA is traditionally considered an exercise to identify potential impacts of a project, and which is intended to be completed early in its development. However, it can also occur after a planning application has been made, or even after an appeal. Early EIA screening decisions can be important for clients, in terms of financial planning and the project programme, but there is growing evidence that delaying the submission of an EIA or ESIA results in loss of avoidance opportunities and unmitigated impacts. In an attempt to address this issue, the Cross Sectoral Biodiversity Initiative (CSBI) has developed a [Timeline Tool](#) in response to a misalignment of key financing and ESIA activities.

Between 2013 and 2015, CSBI released three tools related to applying the mitigation hierarchy for biodiversity management, available for free on the CSBI website:

- The Tool for Aligning Timelines for Project Execution, Biodiversity Management and Financing,
- Good Practices for the Collection of Biodiversity Baseline Data, and
- The Cross-Sector Guide for Implementing the Mitigation Hierarchy.

## 4.5 Climate change

The Paris agreement on climate change will put the energy transition into a higher gear and will have a profound impact on spatial and regional planning, infrastructure development and ecosystem management. Climate mitigation will lead to the construction of on-land and marine wind parks, solar power facilities, CO2 storage facilities, REDD+ activities, increased attention to hydropower, rapid decommissioning of carbon-fired power facilities, etc. In the meanwhile the world has to adapt itself to climate change that will inevitably continue to develop in the decades to come by means of coastal and river defence structures, ecosystem based adaptations, changes in agricultural practices, disaster risk reduction strategies, etc. etc.

All policies, plans, programmes and projects resulting from this transition will have significant impacts on biodiversity. In some cases biodiversity will be seen as a means to solve problems (e.g. nature-based adaptation and mitigation); in many more cases there will be a green-to-green trade off to be made as planning decisions and infrastructure development for climate mitigation or adaptation will go at the costs of existing biodiversity (see example in box below). The mitigation hierarchy and the rapidly developing approaches to biodiversity offsets will be needed urgently to avoid unacceptable losses to biodiversity, additional to the ones that can be expected from climate change itself.

### **Box 7: Green versus green dilemma: wind power and animals.**

Adequate impact assessment is crucial in avoiding this dilemma. After a decade of comprehensive research on wind energy's wildlife implications and mitigation strategies, we are substantially better with methods, measures, and promising tools to tackle unintended trade-offs. Critical issues remain: long term impacts (e.g. possible habituation of birds); cumulative impacts (e.g. on marine mammals); uncertainties (e.g. population estimates of bats); spatial scope (e.g. migratory animals). Such issues have triggered innovations such as adaptive management, planning and zoning approaches, micro avoidance concepts. Such efforts contribute to the reconciliation of ecosystem service conflicts between reducing carbon loads and safeguarding biodiversity.

Source: Bulling and Köppel (2016)

Due to legal requirements in most countries virtually all of the above projects will be subject to EIA and many of the policies, plans and programmes will be subject to SEA. In other words, there is a world to win for biodiversity by applying proper biodiversity-inclusive SEA and EIA to all the activities resulting from the energy transition. Time scales become a more important component to be considered. In addition to describing changes in climate over the anticipated life of the project or programme/policy, the environmental setting will need to include issues such as changes in migration patterns, changes in biodiversity and distribution ranges of relevant species, potential changes in harvesting of the affected resources. Incorporation of climate change will require a

change in describing the baseline setting for impact assessment (<http://www.iaia.org/wiki-details.php?ID=6> )

IAIA has developed CC-related activities under its Climate Change section. It has published Best Practice Principles on CC in impact assessment (IAIA, 2012) and a FasTip (2013) which don't make special reference to biodiversity.

The IAIA Climate Change section has made inquiries with UNFCCC to include environmental assessment tools as tools to address CC. They have so far not been successful as they simply were too late; the window of opportunity was between 2004 and 2008 when the Convention focussed on tool development. Presently the IAIA section is collecting a compendium of 50 good practice cases (25 more to go at the moment of writing) to again try to make the case for impact assessment within the Climate Change Convention (Kolhoff, pers. com.).

The development banks are busy integrating climate change in their disaster risk assessment procedures and in their environmental safeguards. Practical experience so far is limited (Herron, pers. com.).

**Box 8: Three steps for integrating climate change in environmental assessment**

The Netherlands Commission for Environmental Assessment has, based on practical experience in Benin/Togo, Kenya, Bolivia, Myanmar and the Netherlands, defined three steps to ensure climate adaptation is considered in EA:

- 1) **Vulnerability assessment:** Assess climate change risks through the use of at least two climate change scenarios: moderate and extreme. The first scenario will give insight in likely impacts in the nearer future; the second gives insight in the need to reserve certain areas for future eventualities. The combination provides planners and decision makers with an understanding of the flexibility that is required to deal with long-term uncertainties. Include social and economic aspects.
- 2) **Policy compliance:** assess compliance of the proposed project or plan with existing policies for climate change. It provides insight in consistency of the plan with climate change policy objectives. In combination with the vulnerability assessment this gives insight in the urgency to make plans climate robust. If there are no policies yet, compliance assessment has to rely on expert judgement from various sectors involved.
- 3) **Climate-robust alternatives:** the core of the environmental assessment process: develop alternatives, including measures that reduce the effects of climate change or improve the adaptive capacity of stakeholders in the project area. Include alternatives that can be considered to be no-regret measures, particularly in countries where climate change projection are not available or contradictory. Ecosystem services assessment plays a significant role in two cases (Bolivia, Kenya), related to local livelihoods and flood resilience.

Source: Kolhoff and Barten (2015)

## 4.6 Marine environment

New developments that trigger activities to look into the use of impact assessment in marine environment are off shore wind parks, carbon storage and plans for deep sea ore mining. In 2004, the United Nations launched an Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction. Since then, the topic of governing marine areas beyond national jurisdiction (ABNJ) has been widely discussed by politicians, policymakers and scholars. As one of the management tools to protect marine biodiversity in ABNJ, environmental impact assessment (EIA) has been widely recognized and accepted by the international community. The biggest challenge is, however, how to effectively implement the EIA regime in ABNJ (Ma et al., 2016).

The process to adapt the CBD Voluntary Guidelines on Biodiversity in Impact Assessment for marine context revealed significant challenges to apply EIA in marine areas beyond national jurisdiction. Without clear jurisdictions, no identifiable direct stakeholders, and a serious lack of knowledge of ocean biodiversity a serious agenda for further work was created (CBD, 2012; Druel, 2013). In 2012 COP Decision XI/18 on Marine and coastal biodiversity the CBD endorsed the Revised Voluntary Guidelines for the Consideration of Biodiversity in Environmental Impact Assessments and Strategic Environmental Assessments in Marine and Coastal Areas, as presented in Annex 1 of UNEP/CBD/COP/11/23.

Within national jurisdiction marine spatial planning is becoming a necessity in increasingly busy marine areas. Yet, application of EIA legislation to projects in the marine environment is at a relatively early stage (Guerra et al., 2015). Three-quarters of offshore wind power in Europe is deployed since 2010. Their EIAs tend to be very much focussed on the local negative impacts of such interventions while their positive impacts are predominantly felt elsewhere (i.e. climate mitigation). ES approaches are suggested to move beyond the unidirectional perspective of harm and thus offer a broader framework to evaluate trade-offs.

A new development is the establishment of Marine Protected Areas (Hooper et al., 2016). Between 2010 and 2012 the number of countries having at least 10% of their marine territory protected doubled. Here an ES framework could help in developing objectives and monitoring of impacts. Human benefits of MPA's can be better articulated and understood (e.g. tourism and CC mitigation). In a study of 44 marine planning practitioners, 95% has included some ES information in the development of the plan. However, the linkages between social and ecological components were usually neglected, thus limiting the understanding of people-ecosystem interactions.

Some of the more detailed aspects rapidly developing for marine EIA:

- Underwater noise assessment, linked to heavy noise during construction of wind turbines. Although there still is considerable uncertainty in the relationship between noise levels and impacts on aquatic species, the science underlying noise modelling is well understood. Nevertheless, many environmental impact assessments (EIAs) do not reflect best practice, and stakeholders and decision makers in the EIA process are often unfamiliar with the concepts and terminology (Farcas et al., 2016).

- Assessment of the displacement impacts of offshore wind farms on seabirds. (e.g. Busch and Garthe, 2016)
- Offshore geological storage of carbon dioxide and its potential impact on biodiversity is subject to increased study. Gas leaks from offshore CCS may affect the physiology of marine organisms and disrupt certain ecosystem functions, thereby posing an environmental risk. Kim et al. (2016) discuss the present state of knowledge.

In general there is a need for better understanding of the relation between marine habitats and ES provision, how human pressure may reduce service flows, and thresholds and tipping points. Mobility of life is an issue as is the disconnect between services and beneficiaries. Understanding cumulative impacts is needed in increasingly crowded coastal zones (summarised from Hooper et al., 2016).

## 4.7 Resilience

Resilience is rapidly becoming a fashion word, especially in relation to climate change adaptation. Where CC adaptation often refers to the capacity of ecosystems or engineering solutions to return to a stable state after a shock, the Resilience Alliance (<http://www.resalliance.org/>) uses the broad perspective of social-ecological systems. This rapidly developing field of science puts sustainability, planning and impact assessment in a totally different perspective. It stresses the world is inherently complex, reliable predictions on the future cannot be made, and thus the importance of learning and adaptive management become of great importance

Resilience is a property of linked social-ecological systems (SES) and has three defining characteristics (Carpenter, et al., 2006): (i) the amount of change the system can undergo and still retain the same controls on function and structure; (ii) the degree to which the system is capable of self-organization; and (iii) the ability to build and increase the capacity for learning and adaptation. Ecosystem resilience is the capacity of an ecosystem to tolerate disturbance without changing into a qualitatively different state. Resilience in social systems has the added capacity of humans to anticipate and plan for the future.

The key to resilience in social-ecological systems is diversity. Biodiversity plays a crucial role by providing functional redundancy (species occupy similar niches and perform similar functions) and response diversity (sub-populations within a species respond differently to disturbance events). Similarly, when the management of a resource is shared by a diverse group of stakeholders decision-making is better informed and more options exist for testing policies. Active adaptive management whereby management actions are designed as experiments encourages learning and novelty, thus increasing resilience in social-ecological systems. Where it encourages the consideration of a range of scenarios and alternatives, SEA may increase resilience.

Social-ecological systems have some key attributes that make them intractable to conventional management approaches. For example they have non-linear dynamics with thresholds. Interactions between people and nature at different levels of scale can thus lead to changes in ecosystem components that are neither predictable nor controllable. Social-ecological systems are thus subject to complex problems for which there are no definitive or objective solutions; very often, the very application of a solution may in turn create problems. Although the outcomes of events in complex

systems cannot always be predicted and complex systems cannot be controlled, they can be influenced and managed in an adaptive manner.

The characteristics of SEA provide an ideal vehicle for applying resilience thinking in practice, helping to distil out the key issues related to sustainability of both human systems and the ecological systems on which they depend. IAIA has organized a number of workshops to get an overview of the meaning of resilience theory for impact assessment (Slootweg and Jones, 2010). It was concluded that the complexity of social-ecological systems presents a major challenge for impact assessment practitioners who are expected to make confident predictions and management recommendations. Yet, resilience theory is considered providing better insights in the way the world “behaves”.

As a starting point it is suggested to use the nine values for a resilient world, defined by Walker and Salt (2006). These can be used to assess the impacts of a proposed policy, plan or program on the resilience of a social-ecological system. The nine values can be used as a yardstick against which existing SEA practice might be assessed with a view to developing improvements in SEA processes.

- *1. Promote and sustain diversity in all forms (biological, landscape, social, and economic).* Biodiversity is being addressed to a certain extent in impact assessment; social and economic diversity not at all yet.
- *2. Embrace ecological variability rather than control it.* There is a growing trend to move away from hard engineering solutions (being not adaptable and not resilient) towards restoration of ecological functionality (e.g. coastal ecosystems as a soft and flexible defence against storm surges). Impact assessment should take such criteria for resilience into account.
- *3. Maintain a degree of modularity or disconnectedness.* (Think of the risk of rapid spread of contagious diseases in a globalising world, or a global financial crises for that matter, or introduction of invasive exotic species ). One of the problems in impact assessment is the disconnectedness of expert studies hindering a good overview of interrelationships between issues.
- *4. Recognise the importance of slow variables like nutrient, carbon and water cycles.* The important point from an impact assessment perspective is the recognition of “thresholds of potential concern” so that development is undertaken with due caution, with active adaptive management experiments to learn more about the threshold to be avoided.
- *5. Create tighter feedback loops between human actions and environmental outcomes.* The link between ecosystems and human wellbeing has been broken, so there is no feedback linking consumers to the natural environment upon which they depend.
- *6. Promote trust, well-developed social networks, and leadership.* Government agencies have a tendency to keep planning processes behind closed doors until they have created a plan. Lack of transparency leads to suspicion, a defensive response, deadlock, and court cases. A genuinely participatory approach as intended in impact assessment processes can solve many of these problems, and may provide relevant additional information for the planning process.
- *7. Emphasise experimentation, learning, locally developed rules, and change.* From a SEA perspective this means paying more attention to the use of serious alternatives before and monitoring and evaluation after implementation. The proposed development is treated as a learning opportunity rather than the delivery of the ultimate answer to the problem.

- *8. Develop overlapping institutions to increase response diversity and flexibility to change.* An institutions-centred SEA at strategic levels of decision making can assess how well equipped the institutional capacity is to manage environmental impact and to take advantage of environmental opportunities.
- *9. Include all the un-priced ecosystem services in development proposals and assessments.* As discussed earlier, since the MA this subject has received serious attention in impact assessment and up to recently the trend was into the right direction.

The nine values for a resilient world are a good starting point to think about translating resilience in an SEA and planning context. The values are not cast in stone and will develop over time. For example, Biggs et al. (2012) have slightly rephrased the principles to enhance resilience of ecosystem services. The challenge in this respect does not lie with the assessment tool or procedural aspects; there is enough of that and we definitely do not want to develop new frameworks. The real challenge lies in people's ability to accept a different mental model that embraces complexity and uncertainty in management and development. We may even conclude that there is no need for any "new" kind of tool or new steps but simply acknowledge the need for a fundamentally new way of looking at things. A practical tool developed by the resilience community to apply resilience in practice is the resilience assessment workbook (Resilience Alliance, 2010).

It goes beyond the scope of this report (and the capacity of the author) to discuss the consequences of resilience thinking for planning and environmental assessment. This is a new field of thinking with great potential to deal with the problems the world is facing in a more comprehensive and effective manner. Yet, patience is required for the resilience community and capable impact assessment practitioners to translate the rather academic language into plain language and to further develop practical experience in real-world decision-making contexts.

#### **4.8 Sustainable Development Goals**

The 2030 Agenda for Sustainable Development, agreed by the 193 States Members of the United Nations, sets out an ambitious framework of universal and indivisible goals and targets to address a range of global societal challenges. Biodiversity and ecosystems feature prominently across many of the Sustainable Development Goals (SDGs) and associated targets. They contribute directly to human well-being and development priorities. Biodiversity is at the centre of many economic activities, particularly those related to crop and livestock agriculture, forestry, and fisheries.

Yet, strong criticism exists on the SDGs for their apparent contradictory nature. SDGs emphasise the need to hold global warming below a 2° Celsius, restore water-related ecosystems, put a halt to the loss of biodiversity, and an end to overfishing, deforestation, and desertification. Yet, SDGs on poverty reduction rely on (export oriented) growth, considered by many as the cause of all of the problem addressed by the above mentioned SDGs (e.g. Griggs et al. ,2013; Hickel, 2015).

Defenders of the SDGs, on the other hand, point out that the goals have emerged from a genuinely inclusive process that made room for voices from developing countries, unlike the MDGs, which were handed down by technocrats from above. The goals are complex because they recognize that poverty is a complex, structural problem.

The above makes clear that tradeoffs between different SDGs can be expected. Pursuing economic growth without taking into account its potential negative consequences for biodiversity, ecosystem services and underprivileged groups in society is a concrete danger for the realization of the SDGs themselves. This is why the underlying 2030 Agenda for Sustainable Development is has so many references to integration (17 x) and coordination (7 x).

Obviously, good impact assessment at strategic and project level can contribute to the implementation of the SDGs. Based on its three main principles, i.e. (i) good quality information, (ii) stakeholder participation, and (iii) transparent decision making, impact assessment is a tool to avoid mistakes, monitor whether consequences of new plans are according to expectations, or whether a plan needs to be adapted through adaptive management.

#### **Box 9: SDGs as a basis for vision development in SEA for catchment planning in Rwanda**

Integrated water resources management (IWRM) is required by law for catchment management in Rwanda. In an integrated SEA and catchment planning process, the SDGs were used as a basis for discussion with stakeholder on a vision for their catchment. To allow people to step away from thinking from their own sector angle or district perspective, the participants were asked a very broad question: *“Looking at the SDGs, what do you find important for the future of your catchment?”*

The above question was elaborated in several sessions to come to a catchment vision:

- Thematic groups identified three priority SDGs for their catchment (group themes: economy; environment and natural resources; agriculture; private sector; gender and social issues; non-governmental organizations).
- Presentation and aggregation of selected SDGs for all thematic groups together, giving an impression on corresponding and opposing views between groups and a basis for a facilitated discussion.
- Individual voting of all participants after having heard the motivations of all groups.

As a result of these sessions there was an overwhelming agreement on the top priority for the catchment plan:

1. Sustainable land management (SDG 15) was considered to be of basic importance to all other goals. Participants argued that if land, ecosystems and biodiversity are not well managed and integrated into planning, all other goals related to water management cannot be achieved (N.B: Rwanda is a mountainous, densely populated country with serious land degradation, erosion, drought and flood problems.)
2. Ensure access to water and sanitation for all (SDG 6)
3. Sustainable management and efficient use of natural resources, notably water (SDG 12)

After having agreed on the overall vision for the catchment, further detailed analysis of the SDG subtargets gave further detail to the definition of a shared catchment vision.

The advantage of using the SDGs is that it takes people away from concrete issues and concrete project ideas to a more strategic discussion. Splitting people up according to their sectors resulted in



opposing visions, making people realise that discussion and negotiation is part of a planning process. Priorities have to be set. The authority of the SDGs as a deeply debated and worldwide accepted set of development goals avoided discussion on the goals itself; instead participants intensely tried to jointly interpret the rather abstract development goals for their catchment.

Source: Water-4-Growth, Rwanda, internal project docs; see also <http://www.water.rw/>

## 4.9 Other upcoming issue

### Spatial planning

The use of ecosystem services in (SEA for) planning is receiving increased attention in spatial planning and regional land use planning, both in developing countries context as well as industrialised countries (Geneletti, 2001; Honrado, 2013; Partidario and Gomes 2013). Söderman and Saarela (2010) describe planners to be too much concentrated on legally protected species/habitats to avoid ground for appeal. They propose to follow an ecosystem services or green infrastructure approach as a more pro-active planning approach, based on the CBD guidelines. In this respect the mapping of supply and demand for ES is considered a valuable approach, already illustrated by an early case form South Africa appearing in the CBD Voluntary Guidelines (good overview of methodologies in Kopperoinen et al., 2016). The ValuES project has experimented in Namibia with integration of ecosystem services assessment in SEA for regional land use planning. Lessons from one case are summarised in Box 4. These lessons have contributed to the development of an IAIA FastTip on the use of ecosystem services in SEA for spatial planning (IAIA, 2016).

### Urban biodiversity

Urban biodiversity is getting increased attention, often in relation to the quality of living environment, the contribution to public health (especially children), and in relation to the mitigation of expected impacts of climate change, notably the effect of urban heat islands and the accommodation of heavy rainfall to avoid floods. Reference is made to the CBD (2012) Cities and Biodiversity Outlook which calls for the integration of ecosystem services in urban policy and planning. In impact assessment urban biodiversity has not been very prominent yet. Balfors et al. (2016) stress the opportunity to enhance biodiversity and ecosystem services by planning for urban green areas.

### Health Impact Assessment

Since the 90-ies of the last century Health Impact Assessment has firmly established itself in the world of impact assessment. Health Impact Assessment (HIA) is defined as "a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population". HIA is treated as a distinct process in some regions or countries, while fully integrated with other forms of impact assessment in others (<http://www.iaia.org/wiki-details.php?ID=14>)

Biodiversity is increasingly linked to health, either as a facilitator of livelihoods and contributing to health and quality of life in general (e.g. provision of food, safety, medicines or contributing to physical and mental health in urban areas) or as a threat to human health by (transmission of) infectious diseases, pests in agriculture or human-wildlife conflicts.

Chivian and Bernstein (2008) have produced the most comprehensive review available about the relationship of human health to biodiversity. See WHO for more information resources ( <http://www.who.int/globalchange/ecosystems/biodiversity/en/>)

Obviously, the concept of ecosystem services appears prominently in this field. Horwitz and Parkes (2016) rightfully position ecosystem services prominently as a framing device for scoping in health impact assessment.

### **Biodiversity data**

The last decade has seen a significant improve in online access to biodiversity data. EIA studies collect large amounts of data which usually remain hidden in impact statements. A consultation among several hundreds of IAIA members showed current practice is characterised by limited information exchange and the use of in-house databases in assessment. Where data are not available, site-based expert judgement usually is applied. A central (national) spatial data repository is seen as a solution to fragmented use of biodiversity information (González et al., 2014). To make this rich source in information available the Global Biodiversity Information Facility (<http://www.gbif.org/>) has developed an EIA biodiversity data publishing framework, aimed at exchange of data obtained through impact assessment studies (King, et al., 2012; IAIA Special Publications Series No. 7 <http://www.iaia.org/uploads/pdf/sp7.pdf> ).

A good example of an enormous endeavour in collecting biodiversity data is provided by the 408 km trans-Andean pipeline project. A book (Alonso et al., 2013) reports on a science-based approach to the inventory of biodiversity along the pipeline trajectory, contributing significantly to knowledge on biodiversity in the region. However, the book doesn't address the sustainable use and equitable sharing aspects of biodiversity at all. Within a developing country perspective this limited view on only the conservation aspect of biodiversity seems too limited.

An important data collection centre is the UNEP World Conservation and Monitoring Center ([www.unep-wcmc.org](http://www.unep-wcmc.org)) . To inform the discussions leading to the establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) the UNEP-WCMC had been requested to develop a catalogue of relevant assessments. IPBES is now maintaining and further developing this online catalogue of relevant assessments. The catalogue will provide the basis for periodic critical reviews of the assessment landscape and lessons learned. It will facilitate the identification of inputs to the thematic, regional and global assessments, support knowledge exchange and help avoid duplication of efforts. Periodic reviews of lessons learned and captured in the catalogue will inform the Platform's processes.( <http://www.ipbes.net/work-programme/catalogue-assessments> )

IBAT for Business is an innovative tool designed to facilitate access to accurate and up-to-date biodiversity information to support business decisions. The tool is the result of a partnership among BirdLife International, Conservation International (CI), International Union for Conservation of Nature (IUCN) and United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). Data are presented in spatial and tabular formats, and with simple mapping functionality. IBAT links to more detailed information and includes on-the-fly reports and outputs to support specific user needs (<https://www.unep-wcmc.org/resources-and-data/ibat> ).

At country level numerous initiatives exist to collect available data in one accessible database. (See for example Gils, 2015, for Namibia). The document on Good Practices for the Collection of Biodiversity Baseline Data has an extensive annotated annex referring to many biodiversity data portals (Multilateral Financing Institutions Biodiversity Working Group, 2015).

**Box 10: Reality check on assessment data**

A lesson from impact assessment is that an assessment process has to be defined to what information is available and not to what the experts want to model. Be cautious in pushing complex technologies and valuation methods. In this respect 4 principles can apply:

1. Assess available data and skills first. Too often experts come to the region with a scientific application and expecting the conditions to adjust to their tool, rather than the other way around.
2. Propose a method / tool that works with available data and skills. Don't use tools that require more than 2-3 days of simple training (from the present capacity level of stakeholders).
3. Actively engage stakeholders in the development of the application. Hands-on involvement to put a real-world application together - not some separate example from another place or context - can significantly strengthen stakeholder's understanding.
4. Clearly point out the limitations of the results. It is neither good to pretend the results are highly accurate, nor to completely discourage their use blaming it on bad input data.

Basically be pragmatic, strike a fine balance between being naively optimistic and unnecessarily defeatist.

*Source:* Linde, pers. com.

## 5. Conclusions and recommendations

Despite the widespread impression that the integration of biodiversity in international development cooperation is receiving less attention since the beginning of the century (e.g. Roe, 2010), the overview in this report shows there has been an unprecedented effort in refining and expanding our view and knowledge on biodiversity, including in terms of development needs for present and future generations. The impact assessment community has actively contributed in this effort, even though practical obstacles are still considerable.

The Millennium Ecosystem Assessment and its follow up initiative TEEB have firmly established the concept of ecosystem services in the academic and green communities. The adoption of the CBD Voluntary Guidelines on impact assessment and its consistency with the MA framework have guaranteed the further elaboration of these concepts for the impact assessment community. The adoption of the guidelines by the Ramsar Convention on Wetlands and their reworking of the guidelines into a handbook provided of course further weight (Ramsar 2010; example of impact provided by Paritosh et al., 2015). Some development banks and private sector organizations have integrated biodiversity in their safeguards in a manner coherent to the CBD Voluntary Guidelines (notably IFC); additional guidance documents have further elaborated on this.

**Better in-country regulations.** Where biodiversity in the last century was predominantly associated with threatened and protected species and areas (“nature conservation”) and treated in such manner in impact assessment, the introduction of the ecosystem services concept has greatly helped in creating a broader perspective on biodiversity, doing justice to the three objectives of the Convention. This has culminated in the adoption of the SDGs showing a much better mainstreaming of biodiversity compared to the MDGs. Even though the integration of biodiversity in regulatory frameworks has increased, most country regulations still represent the “nature conservation” focus, neglecting non-protected biodiversity and ecosystem services. Because impact assessment has to assess all significant environmental and related social impacts, countries should better embed non-protected biodiversity in their screening and scoping procedures for impact assessment, as proposed by the CBD Voluntary Guidelines. Recognition of ecosystem services provides the best option as it links impacts on biodiversity to stakeholders in society.

Recommendation: the Convention could invite Parties to ensure that screening and scoping procedures, and the associated guidance documents, better take into account non-protected biodiversity, by following the Voluntary Guidelines and by integrating ecosystem services in such procedures and documents.

**Capacity development.** The role of civil society is emphasised in ensuring that policy recommendations and regulations are implemented on the ground and to hold government to account. Where biodiversity has indeed declined on the agenda of some international development assistance agencies, the “good governance” issue remains high on the agenda (Roe, 2010). Around the world impact assessment provides the procedural umbrella that can guarantee stakeholder participation, transparency in decision making, and the provision of relevant information for decision making, indeed three traits of good governance. Yet, in-country capacity, both with government as well as with civil society organizations, is often limited. This document shows that capacity development, in combination with donor requirements and funding enhance the quality of EIA and SEA outcomes.

Recommendation: the Convention could invite or urge donors to support capacity development efforts for government as well as civil society organizations in the implementation of biodiversity-inclusive impact assessment, as a means to enhance good governance and as a means to implement the SDGs in a coordinated and balanced manner.

**Evaluation.** The discussion on biodiversity in impact assessment has moved away from describing the traditional steps in the EIA process (screening, scoping, assessment, review, monitoring), towards thematic discussions on issues such as how the concept of ecosystem services may contribute to better impact assessment, how biodiversity off-sets can be enhanced without losing an eye on the mitigation hierarchy, how to address biodiversity in marine impact assessment, etc. The negative side of this thematic focus is the apparent lack of recent evaluative studies of how biodiversity (in its broad sense as intended by the CBD Voluntary Guidelines) is treated in all phases of impact assessment, both EIA and SEA.

Recommendation: The Convention could invite Parties to carry out, and report on, evaluation studies on the effectiveness of impact assessment to address biodiversity (in the broad sense, based on the three objectives of the Convention) and on whether the assessments contribute to “better” decision making, based on a more systematic monitoring on what happens after decision making, when

projects or plans are being implemented. This invitation could also be extended to donors, development banks, international NGOs, and private sector organizations. SCBD could consider developing a set of indicative guidance questions for such evaluation studies.

**Weak science - policy interface.** Both for the effective use of strategic environmental assessment and for the use of the concept of ecosystem services, there is a widening gap between recent developments in scientific thinking and the application in practice. For SEA the academic thinking has advanced significantly, especially in relation to the “strategic” use of SEA to pro-actively inform planning processes on for example the development opportunities and constraints provided by the environment, defined in terms of ecosystem services. Practice, however, is lagging behind and is often focussed on ticking off the boxes of legal obligations. Of course, the difference between the willing and the unwilling is relevant here, where the unwilling can only be forced by legal sticks and the willing can be invited by the carrot of better plans and decisions.

In this respect Saxena et al. (2016) make a clear statement for the use of SEA in the South Asia region: “While the discourse among practitioners and academicians can continue to revolve around “how to” approaches for streamlining the process, SEA uptake at the country level must be first assured through enabling support of governance and country legislations and backed by sustained efforts of capacity building. SEA could prove to be a useful tool to recognise the linkages between SDGs, biodiversity conservation and securing livelihoods for sustained, inclusive and economic growth in the region.”

For the use of the ecosystem services concept the same has been observed. Following Berghöfer et al. (2016) an important reason for this lies in the disregard by the scientific community of the three dimensions that make information relevant for decision makers. Where scientific credibility is the reference for the scientific community, the legitimacy of information is most relevant for stakeholders in society (i.e. are their interests visibly and understandably taken into account), while salience of information is relevant to decision makers (i.e. does the information relate to their policy environment and is it provided in a timely and appropriate manner for the decision context). In many cases scientific rigour leads to a reduced acceptance of the information by stakeholders and or decision makers. In the words of Sloomweg (2015), we should “*maybe for a while forget about computational models and monetary valuation, and first start asking stakeholders and decision-makers, listen to their language and find out what kind of information is relevant to them.*” Of course, it is important to maintain a balance between all three dimensions of information, and thus (i) value the objectivity of good scientific information, (ii) acknowledge that stakeholders have valuable knowledge to share but that they also have an interest to defend with a potentially biased position, and (iii) understand the broader political agenda of decision makers.

Recommendation: the Convention Secretariat organises many workshops and produces a large number of information documents, which are typically produced in collaboration with external organizations. In these collaborative efforts, there is an ongoing need to strike a balance between scientists, civil society and decision / policy makers, and to build in cross-checks with these organizations on the validity, legitimacy and salience of the information.

**Silo thinking.** A major reason for the lack of uptake of the ecosystem services concept in the impact assessment community is its green connotation and the perception with others that this is a thing for the green silo people; it is not their business. This is reinforced by the amazing amount of ES

assessments being carried out by green silo representatives, completely disconnected from any apparent planning or decision-making context. A transition to a more sustainable future will have to be made by others outside the green silo, so get them involved and listen to their issues before embarking on a study. “Getting social and biodiversity practitioners round the table at the right time” is also reported as an issue from implementation practice (Treweek, pers. com.; author, pers. experience).

The Greater Mekong region case shows sector departments can be made champions of the ecosystem services concept because they are the first to recognise ecosystem services as assets that may be at stake with bad planning. A concern is the tendency to focus on a few ecosystem services only that are relevant to a project (e.g. water supply to an irrigation scheme or industrial facility); always look at the bundle of services provided by the area under impact and in discussion with ALL stakeholders define the priority services to be taken into account in the assessment (see the WRI approach).

Recommendation: The Convention and its Secretariat could initiate or intensify collaboration with sector representative organizations across the globe (energy, roads and infrastructure, water, etc.), listen well to their language and perceptions, and promote biodiversity-inclusive impact assessment as a means to guarantee sector plans and projects are developed that address SDGs within boundaries of social and environmental sustainability.

**Development bank requirements.** When looking at biodiversity requirements imposed by development banks and donors, two opposing tendencies can be observed:

#### 1. The two faces of biodiversity.

The integrative concept of ecosystem services offers significant opportunity to overcome sector divisions and silos. IFC experience has shown that it takes time to embed this new concept within the organization and building support of the concept. On the other hand, maintaining a narrow approach where biodiversity is foremostly defined in conservation terms (threatened species, natural and critical habitat, red lists, etc.) risks reproducing and cementing the green silo while ecosystem services, perhaps because of a perceived lack of practicality, run the risk of being pushed aside – even though the concept provides a linkage between the green and the social and economic domains, and thus many more concrete linkages to the SDGs. At its worst, this could result in perpetuation of the “conservation against development” mindset, and a missed opportunity to use the ecosystem services concept as a means to reach the sustainable development goals in an integrated manner – despite the fact that the 2030 Agenda for Sustainable Development is a document filled with the notion of integration and cross-sector cooperation, and in spite of the vast amount of experience obtained over the last decade.

The new World Bank ESF presents an opportunity to reframe ecosystem services, as they are now referred to as a requirement in some of the social ESSs. Ecosystem services provide the bridging concept for social experts to define biodiversity in terms of human well-being and livelihoods. While this concept has in this respect not been treated in a fully consistent manner in the ESSs, it could be taken up and clarified in further guidance material for the practical implementation of the ESSs.

Recommendation: in its collaboration with the World Bank and other development banks, the Convention secretariat need to continue emphasizing the importance of maintaining requirements for ecosystem services assessment in impact assessment as a way to implement the SDGs and to avoid a disconnect between conservation and development, and to promote the inclusion, into future guidance, of ecosystem services in human well-being and their linkages with the induced impacts on biodiversity and ecosystem functions, and the way in which they are measured and integrated in Environmental and Social Impact Assessment required for funded projects, including in the stages of Strategic Environmental Assessment.

## 2. Dilution of biodiversity.

Towards the end of the past century the term biodiversity was interpreted as a discussion on threatened and protected species and areas, often opposing development initiatives. The ecosystem services concept has helped enormously to broaden the view on biodiversity and to position development within boundaries of sustainable use of biodiversity. In recent years the ecosystem services concept is rapidly being replaced by the Natural Capital concept (e.g. <http://naturalcapitalcoalition.org> ), defined as the world's stocks of natural assets, which include geology, soil, air, water and all living things (<http://naturalcapitalforum.com/about/> ).

Given the fact that ecosystem services are provided by ecosystems, thus including the abiotic environment, the broadening of the concept to natural capital may be conceptually correct and in line with the conceptual framework of the Millennium Ecosystem Assessment. Yet, many consider this as a further commodification of biodiversity. Commodification of nature refers to the expansion of market trade to previously non-marketed spheres. This is a contested issue both in the scientific literature and in policy deliberations. (Hahn et al, 2015). It has led some people to ask themselves: “*Where did we leave biodiversity behind?*” (Broer, pers. com)

The dilution of biodiversity issue is related to world visions of stakeholders. Is it the final victory of capitalism that we consider nature as a commodity, or does it help to explain the social and economic values of services provided by invaluable nature? The fact that the Natural Capital Protocol doesn't even refer to sustainable use or to equitable sharing is in this respect a worrying signal. For the implementation of the 2030 Agenda for Sustainable Development it is a prerequisite to keep a broad and integrated view on biodiversity in impact assessment, following the three objectives of the Convention: conservation, sustainable use and equitable sharing or, in old-fashioned business terminology: people (equitable sharing), planet (conservation) and profit (sustainable use). Sustainability has to do with time; if we add the factor time to the three Convention objectives they become fluid since conservation now is linked to future sustainable use and intergenerational equity. Impact assessment, especially at strategic level, has to take a look into an unknown future. The need to also take climate change into account forces us to look even further ahead.

Recommendation: When endorsing activities by other organizations, care should be taken to ensure that the three objectives of the Convention are well represented in the outputs produced by such initiatives.

**Climate change.** At present the UNFCCC has no specific activities in the field of impact assessment. The Climate Change Section of IAIA and the Netherlands Commission for Environmental Assessment have attempted to put impact assessment on the agenda of UNFCCC but so far did not get a

foothold. With the ratification of the Paris agreement things have dramatically changed. The urgency to put biodiversity on the agenda of UNFCCC is obvious. Similarly there is a need to put impact assessment on the agenda as a practical and legally embedded instrument to safeguard the role of biodiversity in the energy transition.

Recommendation: The Convention and its Secretariat could take appropriate steps to encourage consideration of impact assessment in the UNFCCC context, as a means to highlight the positive role of biodiversity in the energy transition and in the adaptation to unavoidable climate change. The impact assessment communities, represented by IAIA, can play a role by identifying and disseminating best practices. As the President of the European Commission said in 2009, *“the success of our climate change policy will also be measured by the success of our efforts in stopping loss of biodiversity”*.

Overall recommendation: within CBD programmes, make the business case for more attention to impact assessment. Arguments for the use of impact assessment are:

- In all but two countries legally founded and enforceable;
- Obligatory public disclosure of documents and involvement of stakeholders in the assessment process, providing an entry point for underprivileged groups and the NGO community to voice out their interests, and for the press to play its role;
- Transparency in decision making, thus allowing civil society to have a view on what is being decided upon;
- Provides a way to weigh the pros and cons of a proposed plan or project in relation to the SDGs in an integrated manner. The SDGs could be recommended as a basis for the development of assessment criteria (see box 9).

Biodiversity-inclusive approaches to impact assessment can be introduced in:

- the Global Platform for Business and Biodiversity
- UNFCCC
- The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the intergovernmental body which assesses the state of biodiversity and of the ecosystem services it provides to society, in response to requests from decision makers.
- Cross sector Biodiversity Initiative (CSBI) is a partnership between IPIECA, the International Council on Mining and Metals (ICMM) and the Equator Principles Association to develop and share good practices related to biodiversity and ecosystem services in the extractive industries.
- The Natural Capital Coalition



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# Annex 1: Timeline of activities of the IAIA Biodiversity Section

IAIA is the **International Association for Impact Assessment** — the leading global network on best practice in the use of impact assessment for informed decision making regarding policies, programmes, plans and projects



## Biodiversity and Ecology Section of IAIA



Topical forums to share experiences, discuss ideas, engage in topical debate, and develop and promote good practice:

- Biodiversity in impact assessment
- Ecological compensation and mitigation
- Assessment for protected area establishment and management

**1998—2000**

- First meeting of Section in Christchurch, New Zealand
- Section drafts article 14 of the CBD on impact assessment
- Section presents to CBD and Ramsar Conventions on impact assessment as a tool for biodiversity conservation and sustainable use
- Participation in Scientific and Technical Review Panel of Ramsar. Bagri & Vorhies paper on Ramsar Convention and Impact Assessment published

**2001**

- IAIA Action Programme on Biodiversity launched
- MoUs signed with Ramsar Convention on Wetlands Bureau and United Nations Environment Programme
- Contributed to the Convention on Biological Diversity (CBD) at 7th meeting of Subsidiary Body on Scientific, Technical and Technological Advice in Montreal

**2002**

- MoU signed with Secretariat of the Convention on Biological Diversity (CBD)
- Draft decisions adopted by COP 6 to CBD at The Hague, Netherlands
- CBD Biodiversity in EIA Guidelines adopted
- Convention on Migratory Species (CMS) adopts decision to coordinate with Ramsar and CBD on impact assessment approaches
- IAIA presents to COP of CMS on impact assessment as a tool

**2003—2004**

- Capacity Building in Biodiversity and Impact Assessment (CBBIA) begins
- Key Citations series on biodiversity and ecology published
- Action Programme on Biodiversity updated

**2005**

- Special publication series no. 3: Biodiversity in impact assessment
- Impact assessment and project appraisal special issue on biodiversity
- Guidance document on biodiversity, impact assessment and decision making in Southern Africa (CBBIA output)

**2006—2008**

- Best practice guidance for biodiversity-inclusive impact assessment: A manual for practitioners and reviewers in South Asia
- Background document to CBD Decision VIII/28: Voluntary guidelines on biodiversity-inclusive impact assessment
- CBD Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) Guidelines adopted and harmonised with the Millennium Ecosystem Assessment

**2009—2011**

- MoU with Global Biodiversity Information Facility (GBIF)
- GBIF-IAIA best practice guide on publishing EIA-related primary biodiversity data
- Ramsar handbook on impact assessment produced
- Impact assessment, biodiversity and the extractive industries workshop with International Petroleum Industry Environmental Conservation Association (IPIECA)
- 'Inspired by Nature' competition organised in honour of 2010 International Year of Biodiversity

**2012—2014**

- FasTips information sheet on biodiversity assessment
- Special symposium on biodiversity and ecosystem services in impact assessment
- Contributed to paper on Assessing Biodiversity Impacts of Trade: A Review of Challenges in the Agriculture Sector

**2015—2016**

- FasTips information sheet on ecosystem services
- Became a member of IUCN

## Annex 2: A quick internet search

To get an impression of how a number of relevant themes are “present” or “visible” on the Internet, a quick search has been carried out with Google for a general view, and Google Scholar for a view of scientific publications.

Table 3.1: Internet search hits of a number of relevant (exact) phrases.

Number of search results (Boolean search ) on:	Google	Google scholar
"biodiversity" OR "ecosystem services"	60.100.000	1.970.000
"biodiversity"	59.200.000	1.700.000
"ecosystem services"	3.560.000	353.000
"environmental impact assessment"	11.800.000	250.000
"strategic environmental assessment"	401.000	24.400
"biodiversity" AND "environmental impact assessment"	461.000	43.600
"biodiversity" AND "strategic environmental assessment"	193.000	9.310
"ecosystem services" AND "environmental impact assessment"	183.000	11.400
"ecosystem services" AND "strategic environmental assessment"	48.200	3.040
"Voluntary guidelines on biodiversity inclusive impact assessment"	1.200	155
"Biodiversity in EIA and SEA. Background document to CBD Decision VIII/28"	522	15

Biodiversity as a key word produces some 60 million hits; impressive although still modest compared to terms like “money” (2.5 billion hits) or “monkey” (314 million). Ecosystem services, as a subordinate to biodiversity generates 3.5 million hits (some 6%). The same patterns can be recognised in the scientific references .

The exact titles of the CBD Voluntary Guidelines and its background document show a limited number of hits. These documents obviously do not reach a wide audience; they are targeted at a relatively small community. The question whether Decision VIII/28 has had any influence can thus not be answered by looking at these numbers only. It is clear that the world as represented by the Internet does pay significant attention to biodiversity and ecosystem services; impact assessment is well visible although less prominently; the guidelines are dwarfed in numbers. Later on more on this.

Table 3.2 Percentage of biodiversity / ecosystem services search results linked to EIA or SEA

	Biodiversity		Ecosystem services	
	<i>internet</i>	<i>scholar</i>	<i>internet</i>	<i>scholar</i>
EIA	0.7%	2,5%	5.2%	3,2%
SEA	0.3%	0.5%	1.4%	0.8%

When looking at how many of the biodiversity related hits have to do with impact assessment a Boolean search on a combination of exact phrases gives the outcome of table 3.2.

It shows that:

- Impact assessment (EIA and SEA) occurs in a modest, but visible proportion of the total number of search results on biodiversity or ecosystem services, ranging between 0.5 to 5.2% of search results.
- Compared to SEA, EIA is more prominently represented in search results for biodiversity and ecosystem services (2 to 5 times more), both in a general internet search as in the scientific literature (scholar).

Table 3.3 Percentage of impact assessment search results (EIA and SEA) linked to biodiversity or ecosystem services.

	EIA		SEA	
	<i>internet</i>	<i>scholar</i>	<i>internet</i>	<i>scholar</i>
Biodiversity	5.4%	17,4%	<b>48.1%</b>	<b>38,2%</b>
Ecosystem services	1.6%	4.6%	12.0%	12.5%

The percentage of impact assessment related hits that deal with biodiversity or ecosystem services is presented in table 3.3.

It shows that:

- Biodiversity and to a lesser extent ecosystem services occur in a significant proportion of the total number of search results on EIA and SEA, ranging between 1.6% to 48.1% of search results.
- Biodiversity is associated to almost half (48%) of the internet search results for strategic environmental assessment, and to 38% of scientific publications. Ecosystem services are associated to around 12% of hits on SEA. In other words, biodiversity and ecosystem services play a significant, very visible role in strategic environmental assessment.
- Biodiversity and ecosystem services are well represented in the literature on EIA; for a general internet search both issues are less prominently visible.

## Annex 3: Criteria used for evaluating the Environmental Assessment Reports (Seebun et al., 2011)

The assessment of the various reports was based on a number of selected evaluation criteria and relative scores given to each criterion. The study was focussed on how considerations of biodiversity and ecosystem services influence the planning and decision making process for new development, the criteria were structured to give an indication of the impact biodiversity had on the development and not of the severity and significance of the impact.

Criteria were selected based on the guidelines of the CBD (2005), Treweek *et al.*, (2005), Sloomweg *et al.*, (2006), Soderman (2005, 2006) and Khera *et al.*, (2010). The EAs were evaluated using a series of twenty review criteria grouped under four broad categories.

Criteria	Review Questions
<b>1. Consideration of impact on biodiversity, ecosystem and ecosystem services as a key issue in the scoping phase</b>	1. Was biodiversity/ecosystem impact scoped in as a key issue? 2. Was the interrelationship between biodiversity/ecosystem and other impacts (social, economic) considered at the scoping stage?
<b>2. Consideration of alternatives, scenarios, and options and the impact of these on biodiversity, ecosystem and ecosystem services</b>	3. Did the EA process incorporate alternatives, scenarios and options? 4. Was impact of the alternative, scenarios and options on biodiversity/ecosystem described and compared with likely conditions for zero-option development? 5. Was any specific tool used to facilitate impact prediction and assessment? 6. Was biodiversity/ecosystem impact considered separately and not merely as impact on flora and fauna? 7. Was biodiversity approached from the ecosystem perspective (ecosystem structure, functions and processes)? 8. Was the impact on these structure/functions/processes correlated with the impact on ecosystem services (provisioning, regulating and supporting services)? 9. Was any alternative/option/scenario rejected as a result of impact on biodiversity/ecosystem? 10. Did consideration of biodiversity/ecosystem in the EA lead to the identification of any other alternative, not previously considered in the planning for the development? 11. Was impact on biodiversity and ecosystem influential in the identification of the best case scenario for the particular development?
<b>3. Impact of the cumulative effects of the proposed development on other development</b>	12. Has the long term and cumulative effect of other development on biodiversity/ecosystem been assessed with respect to the current proposed development?
<b>4. Influence of biodiversity and ecosystem consideration on the design, planning or decision on the new development and in</b>	13. Did biodiversity and ecosystem consideration in the EA facilitate the integration of a sustainability dimension to the development? 14. Did the EA propose institutional changes?

**integrating a sustainability dimension to the development (institutional changes, legislative framework, influence on future plans and modification to original project/plan/strategy).**

15. Did the EA propose changes in the legislative framework?
16. Did the EA propose mitigation, monitoring, management and action plan for biodiversity and ecosystem?
17. Did the EA identify critical biodiversity/ecosystem issues that should be addressed through specific project-level EIA?
18. Did the EA propose measures that would enhance benefits from ecosystem services?
19. Did the EA propose measures or mechanism that will influence future projects, plans, policies or programmes?
20. Did the EA propose modification to the original development in order to mitigate biodiversity/ecosystem/ecosystem services impact?

Each criteria was scored on a scale of 0 to 1, where 0= issue under investigation was not met in the report, 0.5 = the issue was only partially met and 1= issue was fully met. The scores were used to generate a Biodiversity and Ecosystem Assessment Index (BEI) for the different EAs. The BEI has been adapted from Khera *et al.*, (2010), Atkinson *et al.*, (2000) and Soderman (2005).

The Biodiversity and Ecosystem Assessment Index (BEI) enables quantification of the qualitative answers to the review questions and was calculated as follows:

$$BEI = \frac{(1*A)+(0.5*B)}{20}$$

- A = Number of criteria under investigation fully met
- B = Number of criteria partially met
- 20 = Total number of criteria

BEI can range between 0 and 1 with BEI<sup>max</sup> having a value of 1 for cases where all the review criteria were met completely. While variation in the quality and level of detail and complexity within the EAs with respect to which biodiversity and ecosystem issues were addressed, made interpretation complex and challenging, the use of the Biodiversity and Ecosystem Index approach minimises subjectivity in interpretation and allows an easier overall comparison and aggregation of results. Since all the reports were analysed and interpreted in the same way for similar criteria, it is believed that the indices of the EA reports are truly comparable as long as the statistical limitations are recognised.

Atkinson, S.F; Batia, S, Schoolmaster F, S; and W T Walter (2000). Treatment of biodiversity impacts in a sample of US environmental impact statements. *Impact Assessment and Project Appraisal* 18 (4), 271-282

Convention on Biological Diversity 2005. Decision VIII/28 Impact Assessment: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment. Available from [www.cbd.int/decision/cop/id=11042](http://www.cbd.int/decision/cop/id=11042)

Khera Neeraj and Kumat Ajay (2010). Inclusion of biodiversity in environmental impact assessments (EIA): A case study of selected EIA reports in India. *Impact Assessment and Project Appraisal*. 28(3). 189-200.

Slootweg R, Kolkoff, A, Verheem, R. ( 2006), Biodiversity in EIA and SEA. Background document to CBD Decision VIII/28. The Netherlands Commission for Environment Assessment.

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- Soderman Tarja (2006). Treatment of biodiversity issues in impact assessment of electricity power transmission lines: A Finnish case review. *Environmental Impact Assessment Review*, 26. 319-338.
- Treweek, J., Therivel, R., Thompson, S. and Slater, M. (2005). Principles for the Use of Strategic Environmental Assessment as a Tool for Promoting the Conservation and Sustainable Use of Biodiversity. *Journal of Environmental Assessment Policy and Management* 7(2): 173-199.