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**LINEAR INFRASTRUCTURE AND MIGRATORY SPECIES
THE ROLE OF IMPACT ASSESSMENT AND LANDSCAPE APPROACHES**

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EXECUTIVE SUMMARY

CMS Decisions. The Convention on Migratory Species in its [Decisions 13.130-13.134](#) on Infrastructure Development and Migratory Species, has requested Parties to provide information, through its National Reports, on measures taken to implement Resolution 7.2 (Rev.COP12) on Impact Assessment and Migratory Species. The secretariat is requested to identify information gaps regarding the implementation of Resolution 7.2 and, based on any identified gaps, consider improvements to guidance on preparing National Reports to improve collection of information regarding infrastructure development. Furthermore, the creation of a multi-stakeholder Working Group on Linear Infrastructure is announced under the Scientific Council.

This report is produced in response to the above-mentioned Decisions. It provides an **analysis of the National Reports** for COP13 with suggested additional questions in relation to Resolution 7.2, and an **analysis of existing standards and guidelines**; furthermore it provides a number of **best practice cases** and proposes a **work plan** for the new **Working Group on Linear Infrastructure**. As the report covers three fields of expertise, i.e. biodiversity, infrastructure and impact assessment, the report starts with a descriptive chapter on infrastructure and impact assessment to provide a common information background.

INFRASTRUCTURE AND IMPACT ASSESSMENT (CHAPTER 2)

Infrastructure covers the basic systems and services that a country or organization uses in order to work effectively. The focus in this document lies on the physical manifestation of infrastructure systems and their interactions with migratory species. The scope is further limited to linear infrastructure because of its far-reaching effects on migratory species. Estimates of annual global infrastructure investment needs range from \$3 trillion to \$7 trillion, with projected infrastructure investments surpassing the total current stock in the next decades. This is referred to as a ‘use it or lose it’ moment in economic history. Given the long lifespan of infrastructure investments, it is of utmost importance that projects not only avoid negative impacts (‘do no harm’), but are also low-emission, resilient, sustainable and circular (‘do good’).

Environmental Impact Assessment (EIA) was created at the end of the nineteen sixties in the industrialised world to give a legal voice to the voiceless environment; its use gradually spread around the globe and at present all but three UN Member States have adopted EIA legislation. EIA has to guarantee that the environmental impacts of proposed projects are identified before a decision on the licensing of a project can be given. The procedure is created in such manner that stakeholders and the general public have a legal right of access to this information and in most countries also the right to submit views and comments on the presented information. It is an instrument to inform decision-making with scientifically sound information, create transparency, and thus contribute to the legitimacy of the decision-making process.

Drawing attention to migratory species in EIA. The CBD in its Guidelines for Biodiversity in EIA and SEA put emphasis on two steps in the EIA process as these are fundamentally important to raise issues related to biodiversity, including migratory species. Without properly addressing these first two steps, the whole issue of migratory species runs the risk of going unnoticed in the environmental assessment and project licensing process:

- **Screening** is used to determine which proposals should be subject to EIA, to exclude those unlikely to have harmful impacts and to indicate the level of assessment required. Further guidance on screening for migratory species issues is needed for those having to make a screening decision. Such guidance does not exist.
- **Scoping** is used to identify key issues which should be studied in detail. It is used to define the Terms of Reference for the actual study phase, and sets out the proposed approach and methodology. Promising alternatives are identified. This is the phase in which issues with migratory species have to be specified and study questions and research methodologies defined, for which relevant expertise has to be available.

Strategic Environmental Assessment (SEA) is a logical add on to the existing EIA practice. As EIA can only address the impacts of individual projects, it has difficulty in addressing the cumulative impacts of multiple separate initiatives.

Furthermore, strategic decisions on, for example, energy mix (e.g. wind or gas) or transport options (e.g. road or rail) are often made at higher policy levels, before concrete projects are identified. Taking environmental issues on board during policy development and planning phases can potentially be very influential. SEA is designed to assess the environmental (and social) consequences of upstream governmental policies and plans. The scope of assessment at this level is broader, in terms of geographical reach, time horizon and thematic room for alternative options. The greatest analytical strength of SEA lies in the comparison of alternatives.

SEA steps are not pre-defined. Each planning process has its own characteristics; a national transport plan will have a rather different gestation process as compared to a spatial or regional development plan. Where EIA follows a series of internationally acknowledged steps, the SEA process cannot easily follow a prescribed series of steps; it has to adapt to the steps in an often incremental planning and decision making process. This makes SEA somewhat difficult to envision for outsiders.

Four tiers, or levels of decision-making are ideally present in governmental planning and decision making on infrastructure development. At each level the nature of activities and the geographical area of intervention are more narrowly defined; the scope of assessment clearly changes with it:

- **National policies** such as a national energy or transport policies have no clearly defined activities and no or limited geographical scope. Yet it is important to have an environmental perspective on these policies as fundamental choices are made on, for example, transport modes or energy mix, with serious consequences for the dominant type of infrastructure to be developed. From a migratory species perspective possibly no go zones or closed periods can be defined.
- **Plan definition;** the infrastructure needs are defined within a broadly defined corridor that connects existing or new development 'nodes'. Lines connecting the nodes do not necessarily have to be geographically defined (yet). Identification of migration corridors is of utmost importance at this stage.
- **Programme definition;** investment programmes for a specific area and/or sector are defined, including the identification of alternative routings of linear infrastructure. SEA can be used to study the consequences of routing and technology alternatives, aimed at avoiding major impacts.
- **Project definition.** Concrete projects design with a focus on technical design and selection of the exact location. EIA is legally obliged to assess the impacts of construction, operation and decommissioning phases, including alternative solutions to avoid impacts and proposing mitigating measures to counteract the residual impacts. The EIA report includes an environmental management and monitoring plan.

Recent development in impact assessment show that the integration of biodiversity in impact assessment has received significant attention over the last two decades, from biodiversity related conventions as well as from international financial institutes. SEA is increasingly becoming an established instrument, also in developing countries. While attention to biodiversity is on the rise, the actual implementation on the ground sees huge differences in quality. 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 sustainable alternatives; (v) assessments being prepared too late for having a real impact on decision making; and (vi) capacity constraints in all its dimensions.

The good news with respects to biodiversity is that the overall quality of impact statements is improving and that SEA seems to live 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.

SEA has seen a steady increase in attention and is developing into a mature process, quite different from EIA, geared towards the peculiarities of government planning and decision-making processes. The 'traditional' role of SEA is reactive with a planning process in the lead while the SEA assesses the consequences of the plan (and alternatives if available). However, SEA is increasingly used in a pro-active manner to inform a 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, by defining social and environmental sustainability boundaries for a plan.

To anchor the interest of migratory species in the impact assessment process an important first step is to make sure migratory species become visible for those involved in the screening and scoping for impact assessments. There is a need for guidance on how to screen out issues related to migratory species. For SEA it would be worthwhile to develop strategic guidance on how to provide the relevant information at policy, plan and programme level, what level of detail is needed and what methodologies are available.

Depending on the **level of ambition** of the proponent, impact assessment can be used as a legal tool to force proponents to pay attention to migratory species, or it can be used as an invitation to proponents to develop the best possible plans and projects, taking into account the need to sustain populations of migratory species.

Suggested actions / recommendations on impact assessment:

1. Develop screening guidance for migratory species
2. Develop guidance on SEA information requirements on migratory species.

ANALYSIS OF NATIONAL REPORTS (CHAPTER 3)

In total, 45 national reports, out of a total of 93, were analysed. Observations (bullets) and conclusions from the analysis:

- **Asia is underrepresented** in the available National Reports.
- The **level of detail** in the National Reports is **limited**. Where issues are referred to, it is merely a hint or the mentioning of an issue.

For deeper insights a National Report may not be the appropriate instrument. However, the National Reports do point towards Parties that may be able to provide relevant additional content on topics mentioned in their reports.

- Reports **focus predominantly on** activities related to species conservation and protected areas; in other words, **green sector activities**. EIA and SEA are applied to projects and plans from other sectors (transport, energy, water, etc.) which seem to be largely beyond the reporters' horizon.
- **A minority of National Reports report on the use of EIA (35%) and SEA (11%)** as tools that can be used in support of migratory species. Only two Parties report on the use of SEA for infrastructure planning.

The above two observations address a core issue of this study – how to effectively cross boundaries between sectors, in this case the 'green' and the 'infrastructure' sectors, preferably making use of available legal EIA and SEA instruments. Even though asked for in the National Report format, boundary crossing is very little visible in the National Reports. Neither is the use of EIA and SEA, but this is less surprising as it has not very clearly been asked for.

- **Twenty percent of Parties report on major infrastructure** developments that affect in one way or the other migratory species. Most of these deal with wind turbines, probably because these are subject of a dedicated CMS initiative of the Energy Task Force, resulting in several guidelines.

Although being one of the global major investment sectors with significant impacts on migratory species, linear infrastructure is not reported on. This was not specifically asked for in the report template, but the template does provide sufficient entry points to report on such highly visible threats to migratory species.

- Integrated approaches at **landscape level** are **mentioned by 18%** of Parties, without further information. Follow up with individual countries on cases on which is being reported could provide relevant information on application of various types of landscape approaches.
- Reporting on the **mitigation hierarchy** only refers to mitigation and compensation examples; **avoidance**, the most important priority step in the hierarchy, **is absent**; a well-known problem also in the impact assessment community. With respect to the mitigation hierarchy, impact assessments usually have little influence on project location and design to avoid impacts and, moreover, only mitigate or compensate the impacts; strategic assessment of policies and plans that precede the actual projects, considered the best avoidance mechanism, are absent.

- There is very **little information on standards and tools** to address migratory species in impact assessment; the ‘Appropriate Assessment’ under EU Habitats Directive is mentioned.
- Best practice examples emphasise the **need to integrate environment in sector development strategies** and to look at legal protection of wildlife corridors in spatial / regional planning frameworks. The potential **role of SEA in such efforts is not referred to**.
- A very informative and relevant contribution is a guideline document on eco-friendly mitigation measures to mitigate the impacts of linear infrastructure on wildlife.
- **Citizen science and public data portals** are considered effective tools in support of migratory species by several Parties. Even though not mentioned, impact assessment practitioners are known to make serious use of such information sources.

Publicly available data (including on migratory species), sometimes collected through citizen science projects, is an important development which deserves support and upscaling.

- Identified **gaps in implementing the Convention** refer to well-known obstacles such as the difficulty in reaching decision makers, the lack of integration of migratory species in planning and poverty reduction strategies, the difficulty in mainstreaming in other sectors, the difficulty in coordination between ministries within a country and between countries in a region.
- Four Parties provide insight in **needs for further assistance** to strengthen implementation of the Convention. These include international expert support; support in institutional and technical capacity development, particularly at lower levels of government (decentralisation); more international cooperation and private sector involvement. Two Parties refer to the implementation of CMS targets in EIAs as a priority for future work.

Avoiding impacts, rather than (partially) mitigating or compensating impacts, by upstream strategic spatial and sector planning is recognised. However, the facilitating role of SEA in, inter alia, creating transparency and defining and comparing alternative, sustainable development options, goes largely unnoticed.

Suggested actions / recommendations on National Reports:

3. Based on the analysis of country reports Section 3.3 proposes a number of additional questions for the National Report Format, under the disclaimer that a National Report may not be the appropriate instrument for deeper insights. The provided information is short and limited in explanatory text. A focussed effort under the auspices of the new Working Group may probably provide more insight; several tasks for the Working Group are suggested.
4. Different options to integrate the questions into the existing format are suggested. For each question the topic, a motivation, and the relation to the present format is provided.

STANDARDS AND GUIDELINES (CHAPTER 4)

An overview is provided of existing standards and guidelines addressing the impacts of linear infrastructure, including a gap analysis where it concerns migratory species. The information is subdivided into sections on (i) International Financial Institutions (IFC, World Bank, IADB, EIB, EBRD, AfDB, AsDB, AIIB), (ii) professional best practice guidance, and (iii) recent views on a prominent planning approach for sustainability, the landscape approach, and how this can be used in combination with SEA to better present the cause of migratory species.

Safeguards of International Financial Institutes (IFIs) (Section 4.1)

IFIs use safeguard policies to identify and manage the risks associated to their loans. From biodiversity (and migratory species) perspective the safeguards of all IFIs have over the last decade evolved towards the standard set by the seminal 2012 IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Procedurally, migratory species do appear in the safeguards of IFC, World Bank, EIB, IADB, EBRD, AfDB, ADB, AIIB, as one of the defining characteristics of critical habitat; such habitat should support globally significant concentrations of

migratory species and/or congregatory species. In supporting guidance documents the critical habitat criterion is further developed for practical use; here the migratory species knowledge is limited.

Information needs for migratory species not triggered. Intrinsically, threatened migratory species are addressed by the Red List criterion. Yet, the migratory nature of species creates particular requirements for an impact assessment (for example on geographical and temporal scale of assessment). Migratory species should thus draw special attention, which it presently does not do in a sufficient manner.

Ecosystem services that support the maintenance of areas important for migratory species may go unnoticed. The focus of safeguards is on ecosystem services directly linked to human values. So for example, provision of water for irrigation or public water supply is an ecosystem service on which the safeguards will be triggered; water supply to maintain downstream ecological processes may go unnoticed (e.g. floodplain regime, fresh/salt water balance in a delta, etc.). On the other hand, most standards refer to essential ecological processes or ecosystem functions. However, possible linkages to migratory species are not made.

As with biodiversity in general, **unprotected and non-threatened migratory species run the risk of being ignored** as they are considered common. Yet, if we want to maintain a functional earth, the conservation of common biodiversity is vital, particularly in relation to the continued provision of ecosystem services on which humanity depends. Ecosystem services are typically maintained and guaranteed by 'common' species.. These should not be ignored in EIA, but if the criteria in a safeguards policy do not trigger attention to these species, the risk of oversight is real.

IFI safeguards are focussed on doing no harm, even though some refer to the intention to enhance biodiversity (do good) if possible. The most these safeguards can accomplish is to reduce the rate of biodiversity loss. For actually improving the situation of migratory species, more is needed. This obviously relates to the global transitional change needed to stop further decline of "system earth".

Among the bank documentation **there hardly is any guidance material addressing migratory species**. The best example comes from IFC addressing migratory fish in hydropower dam projects.

Suggested actions / recommendations on International Financial Institutions:

5. IFIs provide supporting documents, which may include topical or geographically focussed documents and best practice cases. Since all banks require special attention to migratory species, additional guidance on migratory species would be the easiest step to enhance the implementation practice for migratory species. This should be a globally applicable document addressing all groups of migratory species. A summary overview of all available CMS documents with an instruction on how and in what circumstance to use each document would make a good start (see for example the CMS document Information Resources for the Renewable Energy sector, or the global CMS migration atlas which is in preparation). A globally applicable document for terrestrial migratory species, comparable to the Guidelines for Addressing the Impact of Linear Infrastructure on Large Migratory Mammals in Central Asia, with additional information on appropriate research methodologies for (functional) groups of migratory species, is still needed. A combination with the earlier recommendation on the drafting of guidelines on screening and scoping for migratory species seems obvious.
6. Appendix I and II listed species are protected under CMS, but may not be protected nationally or not considered threatened. The protected status under CMS is not reflected in the safeguards of development banks, so may go unnoticed. This needs to be corrected through for example the additional information document described above.

Best practice guidance and initiatives (Section 4.2)

Mitigation knowledge well developed. There is a serious body of knowledge and expertise on the topic of habitat fragmentation by linear infrastructure and ways to mitigate the impacts. This report only touches upon the issue by referring to non-scientific guidance documents. Within the scientific community, for example in the area of road or transport ecology, there is much, much more. The advice not to re-invent the wheel, must be taken seriously.

Need for impact avoidance through “upstreaming”. The mitigation hierarchy requires to first study avoidance options. This is a much less developed field, particularly in relation to the need for more strategic spatial and sectoral planning, and the role of SEA in such endeavour. The G20 Quality Infrastructure initiative, very influential in the infrastructure donor community, provides a broad perspective on the consequences of a real transition towards sustainability. It addresses at the highest policy level the need to minimise environmental impacts of infrastructure and to avoid lock-in in unsustainable investments. It does not address migratory species as such, but it does provide entry points for the mainstreaming of biodiversity. A similar call for more focus on upstream, systems-level approaches comes from UNEP’s Sustainable Infrastructure Partnership.

Green infrastructure and nature-based solution are two closely related and rapidly developing fields, particularly in relation to climate mitigation and adaptation. The relevance for biodiversity and migratory species is obvious.

Good biodiversity guidance is produced for several sectors, notably in the hydropower, mining and energy sectors. Aspects related to migratory species are globally applicable and of general nature (e.g. fish, bird, terrestrial animals), with individual species as example cases. Whether these guidelines are followed in practice is difficult to know and has not been further analysed (see [CBD/SBSTTA/21/INF/13](#) for further information).

The impact assessment community has also produced relevant biodiversity guidance material paying good but generic attention to migratory species. Additional information on migration requirements for better defined (groups of) migratory species would be an add-on to existing guidance.

An increasing number of international and country level **biodiversity data portals** are being developed. Open access to such data portals is extremely relevant for good impact assessment practice. It is unclear if and how migratory species are being addressed in such databases.

Visibility of CMS outputs in the impact assessment and infrastructure communities **is low**, yet the information is highly relevant.

Suggested actions / recommendations on best practice guidance and initiatives:

7. The G20 Quality Infrastructure recommendations are not focussed on migratory species, but they very clearly show the changing perspective in the world of infrastructure and the opportunity it provides for a green transition. CMS should, probably in collaboration with other Biodiversity conventions, feed information into and put itself on the agenda of this very influential and agenda setting initiative supported by G20, IMF, OECD, EU, and G20 member countries. Relevant information material and good practice cases to make the case for biodiversity and migratory species can be accommodated by the Global Infrastructure Hub. Biodiversity is seriously underrepresented at the moment. Similarly, relevant information material and good practice cases are needed for the Sustainable Infrastructure Partnership, the International Transport Forum.
8. Therefore, CMS Secretariat or members of the working group are advised to participate in infrastructure community conferences, for example the upcoming (fully digital) International Conference of Ecology and Transportation, to establish contacts with relevant players in this community.
9. Develop ideas and guidance on how migratory species interests can be integrated into nature-based solutions. Contact active platforms such as the [PEDRR](#) clearinghouse for knowledge, training, advocacy and practice on Ecosystem-based Disaster Risk Reduction (Eco-DRR) to see how this information can feed into such initiatives. Similarly, EcoShape’s very practical [Building with Nature](#) initiative is interesting, promoting the concept of hybrid engineering: green where possible, grey where needed. (There is much more; see [wiki page](#)).
10. A more systematic treatment of all (groups of) migratory species from Appendix I and II, for example, by using the concept of functional groups, would provide a relevant add-on to the existing information. Freshwater species are underrepresented at CMS, but are considered an important topic when assessing the fragmentation impacts of (hydraulic) infrastructure.
11. Assess the status of migratory species in global databases and, if necessary, suggest appropriate adaptations. Provide guidance for countries to develop their own databases making, for example, use of citizen science initiatives.

12. Reach out to other global communities, notably the infrastructure and impact assessment communities, highlight the existence of available documentation, and find procedural entry points where the information can feed into planning and assessment processes. Redesign the information in such manner that it is fit for purpose.

Landscape approach (Section 4.3)

Sustainable landscapes. The 21st century presents humanity with the dual challenge to protect nature and to create an equitable home for people living on a finite planet. The need for sustainable landscapes as a source of multiple social, economic and environmental benefits is acknowledged in international policy agreements. Protecting nature as part of productive, sustainable and resilient landscapes is becoming a centre piece in the sustainability transformation agenda. Obviously, migratory species are part of this. Achieving long-term economic, environmental and social goals increasingly depends on understanding and accounting for the impact of land management decisions on ecosystem goods and services, and developing a more coordinated and integrated approach to natural resource management on a larger scale.

The proliferation of landscape approach terminology and products has led to confusion on what a landscape approach represents, how different concepts, frameworks and tools relate to each other. Many people think, or say, they are working at the landscape level or with a landscape approach. Yet, there is quite some confusion on the actual meaning of such statements. The chapter provides an overview of recent thinking on landscape approaches, which boils down to three different interpretations of the landscape approach:

a) Using a landscape scale only. It departs from the biophysical boundaries of a landscape and does not include participatory nor interdisciplinary processes. It aims at understanding patterns and processes at landscape scale. Landscape boundaries are defined by biophysical boundaries only; social-economic and institutional boundaries are not taken into account. This is not what is considered a landscape approach, although it can provide useful insights, especially when looking at interactions between physical infrastructure interventions and migratory species. By adjusting assessments to the scale needed to understand migratory processes, much gain in the quality of assessment can be made.

b) Sectoral landscape approach. Many landscape approaches may start with a sectoral focus but evolve, in response to challenges encountered, to incorporate other objectives and thus develop characteristics of an integrated landscape approach. The simplest form is the interference of one sector plan with conservation objectives in the landscape. Usually, there are interactions with multiple other sectors and stakeholders, so the approach may develop naturally into the third category. For example, a proposed transport corridor will create a barrier to migratory species, but may also cut through communities, take productive agricultural land, or lead to settlement of migrants. Impact assessment can facilitate the identification of affected stakeholders. Inviting these stakeholders into a planning process is not something that impact assessments can impose, but authorities willing to do a good job can easily integrate the principles of a landscape approach into an impact assessment process. The willingness and ambition of the leading actor(s) in the process is critical.

c) Integrated landscape approach. The 'real' landscape approach. Even though the start of a process may be sectoral, the interference with other resource users and conservation goals should ideally lead to an integrated landscape approach. An aspect well developed in impact assessment but entirely neglected in the landscape approach literature is good scoping; what are the really important issues to take into account. Such scoping is, of course, part of a participatory decision. Scoping is a fundamental part of impact assessment procedures, designed to focus assessments on the most relevant issues and keep such studies under control (in terms of time and money expenditures).

Suggested actions / recommendations on the landscape approach:

13. **Promote SEA as a procedural vehicle to implement the landscape approach.** For a landscape approach to be effective it should ideally be linked to a formal planning process such as a regional development plan, a spatial plan, a sector plan (e.g. transport). SEA is designed to provide information on the sustainability of such plans, involve stakeholders in the process and guarantee process transparency. These are shared principles with the landscape approach, so SEA can be an ideal implementation vehicle.

GOOD PRACTICE CASES (CHAPTER 5)

Four cases illustrate many of the issues addressed, referred to throughout the report.

- **SEA for Developing a Gas Pipeline Network for South Africa.** The case provides a conceptually easy and straightforward procedure to define the optimal routing for a gas pipeline network in South Africa, taking into account biodiversity (and other) interests.
- **Biodiversity Conservation Corridors in the Greater Mekong Subregion.** The case shows the importance of good quality and formalised biodiversity information in SEA for corridor planning. It contains additional information on the issue of migratory fish and hydropower dams in the Mekong river.
- **Assessment of Proposed Dams in the Mara River Basin.** A case to show how infrastructure projects can have distant, but serious impact on wildlife migration in a transboundary river basin. Both SEA and EIA play an ill-defined but influential role in providing essential information.
- **Lamu Port-South Sudan- Ethiopia (LAPSSET) Infrastructure Corridor.** A case with SEA at the highest strategic planning level for an international corridor with potentially serious direct and indirect consequences for migratory terrestrial animals.

WORK PLAN FOR THE WORKING GROUP ON LINEAR INFRASTRUCTURE (CHAPTER 6)

CMS COP Decision 13.131 calls for the establishment of a multi-stakeholder Working Group on linear infrastructure composed of stakeholders with experience and knowledge on the impact of linear infrastructure development on migratory species and options for mitigation. The **agenda of this working group is set by the following observations:**

Legal and procedural instruments to take migratory species into consideration in the preparation and funding of policies, plans, programmes and projects linked to infrastructure **are in place.** EIA and increasingly also SEA are effective instruments to address potential environmental impacts prior to decision making. International financial institutions apply these instruments to implement their environmental safeguards policies. Even though content-wise the attention to migratory species in safeguards is rather minimal, the necessary ‘hooks’ to flag issues related to migratory species are there. The need for good screening and scoping guidance has already been discussed.

Relevant knowledge is available but dispersed. Infrastructure planners and decision makers are often little aware of the issue and the need to include this in their decision-making processes or may not know where to find relevant information. Guidance documents do not address migratory species in any consistent manner. They do not go into any detail on different functional species groups, research methodologies, sources of information. In other words, the available detailed scientific information needs to be mainstreamed for general use.

From mitigation to avoidance to improvement. Where most documents focus on mitigating the impacts of linear infrastructure, the real question of course is how to entirely avoid negative impacts by alternative routing or design of infrastructure. And, more ambitiously, how to contribute to a better and healthier planet by enhancing the situation of migratory species. For a real transition to a sustainable world the level of ambition has to be raised from doing no harm to doing good.

Mainstreaming by upstreaming. From the infrastructure community, the biodiversity community and the impact assessment community there are consistent calls for more strategic planning to be able to address the challenges posed by the Sustainable Development Goals. At higher planning levels there is more room for integrated planning at landscape level. The issue of migratory species has to be part of the process. Where EIA continues to play its role in avoiding negative impacts (do no harm) of proposed projects, SEA can be used to start thinking in terms of enhancement (do good) and thus contribute to a transition towards sustainability.

Look beyond the migratory species agenda. For CMS and the Working Group it is important to think about the consequences of the above approach since its focus of attention has to go beyond the migratory species agenda. Plans for economic corridors (like China's belt & road and many others) and policies that may lead to major infrastructure works (e.g. energy, transport, water policies) have to be identified as early as possible in order to be "on board".

Potential members of the working group can be found in the following categories:

- Infrastructure sector
- Impact assessment community, most likely through IAIA
- International Financial Institutions
- Scientific community involved in migratory species
- Global biodiversity data portals
- Some national governments, preferably represented by line ministries responsible for the planning of major linear infrastructure works (e.g. transport or energy department).
- International NGOs
- International platforms such as CBD, IPBES and infrastructure platforms.

Suggested actions / recommendations for the working group (in summary):

14. **Reach out** to the infrastructure community and learn their language and procedures.
15. **Provide information** on migratory species, geared towards the processes in which it is used (fit for purpose).
16. **Facilitate integration of migratory species interests** into existing planning and impact assessment processes by developing guiding materials.
17. **Seek synergies** and work with Parties

1. INTRODUCTION

[Decisions 13.130-13.134](#) on Infrastructure Development and Migratory Species request Parties to provide information, via their National Reports on measures taken to implement [Resolution 7.2 \(Rev.COP12\)](#) on Impact Assessment and Migratory Species, and share information on challenges, lessons learnt and needs for further capacity development. Furthermore it asks to establish a multi-stakeholder Working Group on linear infrastructure. The Secretariat is requested to (a) identify information gaps regarding the implementation of Resolution 7.2 and, based on any identified gaps, consider improvements to guidance on preparing National Reports to improve collection of information regarding infrastructure development for review by the Standing Committee as part of amendment(s) to the National Report format under [Decision 13.14](#); (b) compile existing standards, guidelines, and best practices related to addressing the impact of linear infrastructure development and make them available online.

This report has been drafted in response to Decisions 13.130-133 with the specific aims to (i) increase the knowledge of how CMS Parties are using Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) or landscape approaches in their infrastructure planning and development in order to comply with their obligations under the Convention to prevent, remove, compensate for or minimize the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; (ii) to assess existing standards, tools or mechanisms that support Parties in conducting EIAs / SEAs and landscape approaches; and (iii) to compile best-practice examples of measures that allow for mitigating the effects of linear infrastructure or natural resource exploration on migratory species and make recommendations on their use to the 14th meeting of the Conference of the Parties (COP14) in 2023.

The work is carried out for the CMS Secretariat in support of the establishment of the Linear Infrastructure Working Group under the CMS Scientific Council.

The scope of the work is determined by the above mentioned Decisions. However, given the extensive work already done by the Energy Task Force on [renewable energy and powerlines](#) in relation to birds, bats and marine mammals, these infrastructure elements have not been treated in any detail in this report, to avoid duplication.

The analysis in this report covers three large fields for which the overlap has to be found: biodiversity, (land-based) infrastructure and impact assessment. Migratory species are part of global biodiversity. Most relevant international and national legislation, regulations and additional guidance material have biodiversity as a starting point (often described as biodiversity and ecosystem services = BES). Therefore, BES is used as entry point while in the analysis a migratory species “lens” is applied. Similarly, linear infrastructure is part of the broad field of infrastructure, ranging from urban development to waste water treatment, digitalisation and roads. “Linear” may thus not be the best entry point when looking for CMS entry points in the infrastructure community. The impact assessment community is focussing on how it can support and influence decisions at various levels of decision –making, i.e. on the level of policies, plans, programmes and concrete projects. This community probably provides the best material related to migratory species. In summary, the analysis started by casting the net wider to be able to find elements related to migratory species or potential entry points where the migratory species agenda could fit in.

The report starts in Chapter 2 with an overview of infrastructure and impact assessment, with the dual purpose of providing an introduction for those not familiar with the matter, and to define the boundaries of what can realistically be reached by the impact assessment instrument in the infrastructure sector. It is largely based on work by the G20 Working Group on Quality Infrastructure, Decisions and Information Documents from the Convention on Biological Diversity and the International Association for Impact Assessment. The chapter already preludes on possible tasks for the Working Group.

In response to [Decision 13.131\(a\)](#) and [Dec. 13.133\(a\)](#), Chapter 3 provides an analysis of the National Reports on how EIAs, SEAs and landscape approaches are used in infrastructure planning and development. The chapter is subdivided in an explanation of the approach, the actual analysis and a proposed set of questions to be included in the National Report Format.

In response to Decision 13.133(a&b), Chapter 4 provides an overview of existing standards and guidelines addressing the impact of linear infrastructure, including a gap analysis where it concerns migratory species. The chapter is subdivided into sections on International Financial Institutions, professional best practices guidance, and the landscape approach as a planning tool. Each section ends with conclusions and recommendations. The information is obtained from publicly available documents from financial institutions and peer reviewed publications by International NGOs and communities of infrastructure, biodiversity and impact assessment professionals. The sources are made accessible through text hyperlinks.

Chapter 5 gives a number of concrete best practice cases in which the interests of migratory species have been taken into consideration through the use of impact assessment. Where relevant, reference is made to these cases throughout the report as an illustration of how things can work in reality.

Chapter 6 provides the Work Plan for the Linear Infrastructure Working Group asked for in Dec. 13.131(c). It translates the conclusions and recommendation of the other chapters into a concrete agenda of work.

2. INFRASTRUCTURE AND IMPACT ASSESSMENT

This Chapter provides a further description of infrastructure and its different types of impacts; it furthermore gives a short overview of the history of impact assessment, its present state with regards to addressing biodiversity, and special emphasis on recent developments in application of strategic environmental assessment. The chapter provides insights in possible tasks for the Working Group.

2.1 INFRASTRUCTURE

Infrastructure is the essential foundation for economic and social activities; it covers the sectors energy, transport, water, cities and digitalisation. Infrastructure covers the basic systems and services that a country or organization uses in order to work effectively ([Cambridge dictionary](#)). In this document the focus lies on the physical manifestation of infrastructure systems and their interactions with migratory species. From a migratory species point of view the differentiation between point and linear infrastructure is relevant, as the latter has most far reaching effects on migratory species.

Linear infrastructure serves to connect ‘nodes’ or ‘hubs’ with concentrations of activities such as seaports, industrial centres, regional distribution centres, urban areas and areas of agricultural development, or to open up new areas of development. Such linear infrastructure includes roads, railways, waterways, pipelines, power lines, information cables and associated infrastructure such as fencing. Linear infrastructure development is often part of a broader economic corridor planning scheme (see Box 2.1).

Estimates of annual global infrastructure investment needs range from \$3 trillion to \$7 trillion. It is estimated that by 2050, 25 million kilometres of new roads will be built. This represents a 60 per cent increase in global road infrastructure since 2010. It is further estimated that 90 per cent of new road construction will occur in developing countries, many of which are exceptionally high in biodiversity. With regard to railway infrastructure, the situation is similar. It is estimated that, over the next 40 years, passenger and freight travel will double over 2010 levels. To meet this demand, rail infrastructure will increase with an estimated 335,000 kilometres of rail track (data from [CBD, 2017](#)). The next decade is a ‘*use it or lose it*’ moment in economic history with infrastructure investments surpassing the total current stock ([New Climate Economy, 2018](#)). Given the long lifespan of such investments, we must ensure projects not only avoid negative impacts (*‘do no harm’*), but are also low-emission, resilient, sustainable and circular (*‘do good’*) (See for example [EU, 2020](#)).

Box 2.1: Linear infrastructure and economic corridors

Much of the anticipated infrastructure development will be driven by the need to access resources, such as minerals, oil and gas, and timber, and to improve trade and transportation. The infrastructure sector is intricately linked to developments in other sectors. This is why international economic corridors are high on the political agenda. Economic corridors are the focus of large targeted investment strategies, which include major transport systems and bilateral agreements on trade, power interconnection and generation, tourism, agriculture, and telecommunications. Corridors may be turned into Special Economic Zones with special fiscal regimes, as a measure to boost economic activities within the corridor. Countries may also have geostrategic interests in the creation of international infrastructure corridors to have better access to their markets abroad (with the Chinese [Belt & Road initiative](#) as globally most prominent initiative).

Environmental effects linked to linear infrastructure development have the following characteristics:

- i. **Direct effects.** Direct effects depend on type of activity (e.g. road or pipeline), applied technology (e.g. above or underground pipeline), geographic circumstances (e.g. seismic, flood, weather related risks), type of ecosystem (e.g. wetland or dryland), density of human population and traffic density (disturbance; wildlife-vehicle collision risk) and more. Most important direct effects are habitat loss, fragmentation and isolation, partial or complete barrier effects that interrupt migratory pathways (e.g. roads, fences, dams and reservoirs) and the altering of natural processes (e.g. hydrology, erosion/sedimentation, fire, invasive species).

- ii. **Indirect impacts.** Infrastructure facilitates further developments, with intended (e.g. planned human settlement) or unintended consequences (e.g. illegal settlement, hunting or logging in formerly inaccessible areas, spread of diseases). These impacts are usually more severe and affecting a wider area than the direct infrastructure impacts. Especially road expansion can open up areas for new settlement and exploitation, potentially leading to overexploitation of resources, land speculation, human wildlife conflicts, loss of culture, local knowledge and livelihood of indigenous groups.
- iii. **Area of impact.** In general, linear infrastructure projects use the concept of 'effect zone', i.e. a zone of a certain width parallel to the entire project, used to quantify potential negative ecological, environmental and social impacts. From a migratory species perspective such effect zone obviously is too narrow to describe impacts. Wildlife migration connects areas far away from each other. A migration corridor can be through the air (flyways for birds and bats), over land (movement of terrestrial animals), or via water (migration of aquatic species in inland waterways and marine areas) encompassing countries, river basins, or multiple continents. If an infrastructure project obstructs a migration corridor, the effects can thus be noticed in areas far beyond the traditional effect zone. Particular attention is needed for such effects in environmental assessments.

2.2 A CLOSER LOOK AT EIA AND SEA

Environmental Impact Assessment (EIA) was created at the end of the nineteen sixties in the industrialised world to give a legal voice to the voiceless environment. The reasoning was that the interests of people and the economy were well represented in existing legal procedures for the approval of proposed projects, but the 'voiceless' environment needed a separate instrument. EIA has to guarantee that the environmental impacts of proposed projects are identified before a decision on the licensing of a project can be given. The procedure is created in such manner that stakeholders and the general public have a legal right of access to this information and in most countries also the right to submit views and comments on the presented information. It is thus an instrument to inform decision making with scientifically sound information, create transparency, and thus contribute to the legitimacy of the decision-making process. In the following decades the instrument was adopted by virtually all countries, more or less following the same procedural logic (see figure 2.1; check [this world map](#) produced by the Netherlands Commission for Environmental Assessment for a global overview of the status of EIA and SEA legislation).

As explained by [CBD, 2006](#) the first two steps in the process are of fundamental importance to raise issues related to biodiversity, including migratory species. All other steps can also be further elaborated for migratory species, but without properly addressing the first two steps the whole issue of migratory species runs the risk of going unnoticed in the process:

- **Screening** is used to determine which proposals should be subject to EIA, to exclude those unlikely to have harmful impacts and to indicate the level of assessment required. Screening can be based on (legally defined) lists of projects of certain size for which EIA is required or on formal guidelines (or safeguards) in combination with expert judgement as used by most of the development banks. Obviously, it is important to highlight potential migratory species at this stage. Guidance on screening for migratory species issues would make sense for those having to make a screening decision. Such guidance hardly exists.
- **Scoping** is used to define the focus of the impact assessment and to identify key issues which should be studied in more detail. It is used to define the Terms of Reference for the actual study phase, and sets out the proposed approach and methodology. Usually stakeholders are provided an opportunity to express concerns on the proposed project, which may be translated into assessment questions. During the scoping phase promising alternatives can be identified for in-depth consideration during the EIA study. This is the phase in which issues with migratory species have to be identified and study questions and research methodologies defined, for which relevant expertise has to be available.

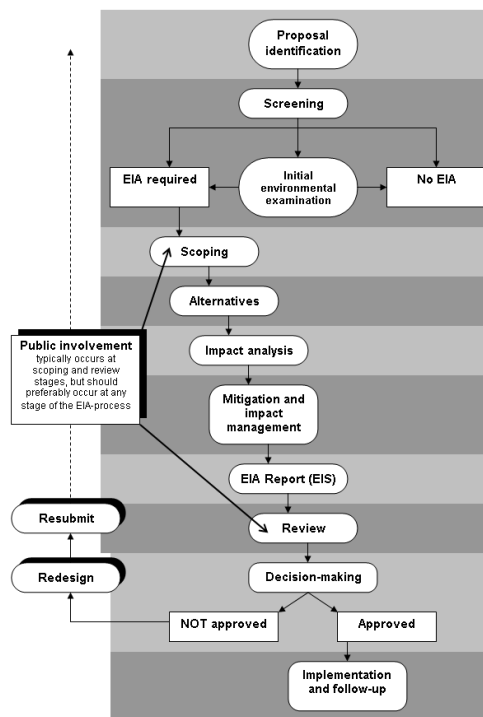


Figure 2.1: Generally applicable EIA procedure; individual country regulations may differ in terminology and steps (see short introduction video's here on [screening](#), [scoping](#) and [assessment](#)).

The CBD guidelines on impact assessment do include references to ecological connectivity and migratory species, but only in a generic manner without any further detail on characteristics of groups of migratory species (terrestrial, aquatic, avian), their migratory ranges and patterns, and specific threats to these groups by human activities ([CBD/COP/DEC. VIII/28, 2006](#)).

Strategic Environmental Assessment (SEA) is a logical add on to the existing EIA practice. As EIA can only address the impacts of individual projects, it has difficulty in addressing the cumulative impacts of multiple separate initiatives. Furthermore, strategic decisions on, for example, energy mix (e.g. wind or gas) or transport options (e.g. road or rail) are often made at higher policy levels, before concrete projects are identified. Taking environmental issues on board during the policy development phase can potentially be very influential. SEA is designed to assess the environmental consequences of higher governmental policies and plans. Nowadays this is considered the best level to discuss alternative development pathways, needed for a true green transition in development. The scope of assessment at this level is broader, in terms of geographical reach, time horizon and thematic room for alternative options. The assessments are less detailed and often qualitative or semi-quantitative (e.g. impact scales instead of actual impact levels). The greatest analytical strength of SEA lies in the comparison of alternatives. For the comparison of alternatives quantified numbers are less important; it is relatively easy to score on criteria whether one option is (far) better or worse than the other. In other words, lack of detailed information in proposed plans cannot be an excuse for not assessing environmental consequences.

The International Association for Impact Assessment (www.iaia.org) has adopted performance criteria for SEA ([IAIA, 2002](#); key citations on SEA [here](#)), to provide general guidance on how to build effective new SEA processes and evaluate the effectiveness of existing SEA processes (see Box 2.1).

Box 2.1: IAIA performance criteria for SEA	
<p>A good-quality Strategic Environmental Assessment (SEA) process informs planners, decision makers and affected public on the sustainability of strategic decisions, facilitates the search for the best alternative and ensures a democratic decision-making process. This enhances the credibility of decisions and leads to more cost- and time-effective EIA at the project level. For this purpose, a good-quality SEA process:</p>	
Is integrated	<ul style="list-style-type: none"> • Ensures an appropriate environmental assessment of all strategic decisions relevant for the achievement of sustainable development. • Addresses the interrelationships of biophysical, social and economic aspects. • Is tiered to policies in relevant sectors and (transboundary) regions and, where appropriate, to project EIA and decision making.
Is sustainability-led	<ul style="list-style-type: none"> • Facilitates identification of development options and alternative proposals that are more sustainable.
Is focused	<ul style="list-style-type: none"> • Provides sufficient, reliable and usable information for development planning and decision making. • Concentrates on key issues of sustainable development. • Is customized to the characteristics of the decision-making process. • Is cost- and time-effective.
Is accountable	<ul style="list-style-type: none"> • Is the responsibility of the leading agencies for the strategic decision to be taken. • Is carried out with professionalism, rigor, fairness, impartiality and balance. • Is subject to independent checks and verification • Documents and justifies how sustainability issues were taken into account in decision making.
Is participative	<ul style="list-style-type: none"> • Informs and involves interested and affected public and government bodies throughout the decision-making process. • Explicitly addresses their inputs and concerns in documentation and decision making. • Has clear, easily understood information requirements and ensures sufficient access to all relevant information. • Ensures availability of the assessment results early enough to influence the decision-making process and to inspire future planning.
Is iterative	<ul style="list-style-type: none"> • Provides sufficient information on the actual impacts of implementing a strategic decision, to judge whether this decision should be amended and to provide a basis for future decisions.

Initially, SEA started with the same process steps as EIA (for example the [EU SEA Directive](#)). A plan was prepared and SEA assessed the consequences. It soon became clear that for maximum effectiveness SEA should start early in the planning process and inform this process at various moments along the way. Each planning process has its own characteristics; a national transport plan will have a rather different gestation process as compared to a spatial or regional development plan. It became clear that SEA could not simply follow a prescribed series of steps; it has to adapt to the steps in an often incremental planning and decision making process. The influential [OECD-DAC SEA guidelines](#) does provide a series of steps for plans and programmes, but emphasises flexibility in the design of each SEA process (see Box 1).

Box 1: Stages and steps for undertaking SEA at the plan and programme level

Stage 1: Establishing the context for the SEA

- Review the need for the SEA, and initiate preparatory tasks
- Identify interested and affected stakeholders and plan their involvement

Stage 2: Implementing the SEA

- Determine the scope of the SEA
- Establish participatory approaches to bring in relevant stakeholders (as part of the Scoping process)
- Collect baseline information
- Analyse the potential effects of the proposals and any alternatives
- Quality assurance
- Reporting

Stage 3: Informing and influencing decision-making

- Making recommendation in dialogue with stakeholders

Stage 4: Monitoring and evaluation

- Monitoring decision taken on the plan
- Monitoring implementation of the plan
- Evaluation of both SEA and plan

Source: OECD-DAC (2006): [Applying Strategic Environmental Assessment](#). Good Practice Guidance For Development Co-Operation.

Four tiers, or levels of decision making are ideally present in governmental planning and decision making on infrastructure development ([NCEA, 2017](#) for CBD SBSTTA 21). At each consecutive level both the nature of activities and the geographical area of intervention are more narrowly defined:

1. **National policy.** Covers a (sub)sector such as a national energy, transport or industrial development policy. Such policies have no clearly defined activities and no or limited geographical scope. Impact assessments at this level are broad and qualitative; yet it is important to have an environmental perspective as fundamental choices are made, for example on required transport modes or energy mix of a country. Such policy choices define the dominant type of infrastructure to be developed (road, rail, canal; wind parks, hydropower dams, etc). From a migratory species perspective possibly no go zones or closed periods can be defined in such policies.
2. **Plan definition.** Based on national development policies, the needs and opportunities for infrastructure development are identified within a broadly defined corridor. A corridor aims at connecting existing or potential development 'nodes' or 'hubs' to (inter)national markets. Sectors to be developed are identified and related infrastructure needs defined. Often, a corridor connects different countries, so the planning may be coordinated under a supranational body. In this phase a corridor may be represented by a network of connected nodes; lines connecting the nodes do not necessarily have to be geographically defined (yet). SEA can be used to define environmental and social boundaries of sustainability and compare alternative development options against these boundaries. Identification of migration corridors is of utmost importance at this stage (See GMS case in chapter 5).
3. **Programme definition.** Based on priorities defined in the overarching plan, investment programmes for a specific area and/or sector are defined, including the identification of alternative routings of linear infrastructure. The routing alternatives are geographically defined zones up to some 100 km width. SEA can be used to study the consequences of routing and technology alternatives, aimed at avoiding major impacts. (See pipeline case in chapter 5)
4. **Project definition.** Definition of concrete projects to be implemented. For linear infrastructure the focus lies on technical design and selection of the exact location within the selected routing zone. EIA is legally obliged to assess the impacts of construction, operation and decommissioning of proposed projects, study alternative solution to avoid impacts, propose mitigating measures to counteract the residual impacts.

In practice, corridor development will not neatly follow the above hierarchy. A corridor initiative often builds on ongoing regional development processes; it is a combination of up-to-date existing activities, upgrading of old facilities and

completely new activities. For example, the [LAPSSET corridor](#) in Northern Kenya (see example case in chapter 4) creates significant new infrastructure to connect the already upgraded port of Lamu with the hinterland. Contrary to this, the [Southern Agricultural Growth Corridor of Tanzania](#) (SAGCOT) is a public-private partnership intended to improve incomes, employment and food security in southern Tanzania, building on the already available infrastructure. The planning of multiple corridors in the Greater Mekong Sub region (see case in Chapter 5) is a mixture of both.

2.3 RECENT DEVELOPMENTS IN IMPACT ASSESSMENT

The integration of biodiversity in impact assessment has received significant attention over the last two decades, in 2017 extensively reviewed in [CBD/SBSTTA/21/INF/13](#). It started with CBD adopting in 2006 its voluntary [Guidelines on biodiversity in EIA and SEA](#), with elaborate supporting documents and case studies. These guidelines were adapted and adopted by the Ramsar Wetland Convention and CMS. In 2012 IFC produced its milestone Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources, later followed by many development banks including the World Bank (see next chapter). Parties to CMS, CBD and other governing bodies have repeatedly called for application of impact assessments to address biodiversity-related issues (e.g. CMS 2017 Resolution 7.2 (Rev.COP12), CBD Decision 14/3 on [Mainstreaming of biodiversity in the energy and mining, infrastructure, manufacturing and processing sectors](#) in 2018, or the Ramsar 2010 [Handbook 16 on Impact Assessment](#)). SEA has increasingly become an established instrument, also in developing countries.

While attention to biodiversity in impact assessment is on the rise and implementation is according to CBD/SBSTTA/21/INF/13 improving, the actual implementation on the ground sees huge differences in quality. 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 sustainable alternatives; (v) assessments being prepared too late for having a real impact on decision making; and (vi) capacity constraints in all its dimensions.

With respect to the way in which biodiversity is being addressed in impact assessment practice, the available information points to certain directions (cited from [CBD/SBSTTA/21/INF/13](#)):

- 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. Highly publicised “brilliant” practice cases, somewhat blur the picture of the invisible, not-so-perfect 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 the relatively short track record for SEA does not provide enough room for comparison over time.
- Country regulations often have a narrow focus on biodiversity with a focus on protected species and habitats, while little attention is given to ecosystem services and maintenance of essential ecological processes.
- Donor and capacity development support contribute to the quality of impact assessment.

2.4 ROLES OF SEA

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). This type of SEA is common practice when the level of environmental ambition of the proponent is low and the SEA is considered a regulatory obligation; it often ends up as a tick mark exercise in which the obligatory boxes are checked.

However, SEA can also be used in a pro-active manner to inform a 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, by defining social and environmental sustainability boundaries for a plan. Highlighting the presence of migratory species, including timing and location of migration, would be relevant input in such SEA. This approach helps to avoid the perception of environmental assessment being a hindrance to development. Moreover, the SEA provides a good knowledge base to assess whether a region has the potential to facilitate human development ambitions. When used in a pro-active manner, an SEA can thus define options for sustainable development.

Ideally an SEA will go through a pro-active and a re-active phase. First by pro-actively informing the planning process on the opportunities and constraints of the area, thus defining the boundaries of sustainability, and provide pertinent input for the development of alternatives (“*How does the environment influence the plan?*”). Subsequently, the SEA will assess the consequences of proposed plan measures when these become more clearly defined (“*How does the plan influence the environment?*”).

When SEA is used with the intention to define sustainable development options, the lower tiers of programme and project definition will become easier, with more emphasis on the exact quantification of impacts, the definition of mitigation measures to avoid or reduce remaining impacts, and the development of an environmental and social monitoring and management plan.

Chapter 4.4 will pay attention to the application of a landscape approach within the procedural framework of SEA to provide the best of two worlds. The landscape approach is a tool to deal with complex issues at landscape scale, with multiple stakeholders, and multiple issues at stake. SEA is a tool to formalise such landscape approach in a decision-making context, with in-built guarantees of participation, sharing of information and transparency in decision-making. But only if plan proponents have the ambition to aim for environmentally sustainable, socially acceptable, and financially and institutionally feasible solutions.

2.5 HIGHLIGHTING THE INTERESTS OF MIGRATORY SPECIES IN IMPACT ASSESSMENT

While screening is important for flagging potential issues with migratory species (the alarm bell), scoping is important for the precise definition of things to be studied, including the geographical and temporal scope of the study¹ and the methodologies to apply, the identification of less harmful alternatives and the involvement of relevant stakeholders and experts.

Recommendation: An important first step is to make sure migratory species become visible for those involved in the screening and scoping for impact assessments. There is a need for guidance on how to screen out issues related to migratory species, to inform for example development banks on how to apply their safeguards, or departments with the responsibility to screen proposed projects (depending on the applied EIA system these can be environmental agencies or environmental cells within line ministries).

The information requirements for each level of planning and decision making is different. Type of activities and geographic areas may at higher planning levels not be defined yet making it more complicated to assess environmental consequences. Nevertheless, choices in national policies and sector and spatial plans have far reaching effects, thus making it relevant to put migratory species on the agenda of policy makers.

Recommendation: CMS already has a number of relevant technical guidance documents available on how to take into account migratory species in EIA processes, but in practice these seem to be underutilised. The uptake of these available resources should be strengthened.

For migratory species it would be worthwhile to develop strategic guidance on how to provide the relevant information for SEA at policy, plan and programme level, what level of detail is needed and what methodologies are available (e.g. remote sensing, satellite or gsm-tracking, field observations, citizen science, etc.). The information document ([CBD](#)

¹ Geographical dimension is a complicating factor with migratory species, as the range of these species very often is transboundary. Impact assessment specialists usually work with a fixed project area and area of impact. For migratory species it is of utmost importance to be more flexible in defining the geographic range of impact. For the temporal dimension it is important to highlight that it may be possible for some projects (especially during survey and construction) to be conducted when there are no migrants around while defining a no go area or ecological corridor for when the species need it.

[Technical paper 26](#)) in support of the CBD Decision on impact assessment provides a possible methodological approach (based on the availability of information on either drivers of change or geographical location, or a combination of both²).

Depending on the level of ambition of the proponent, impact assessment can be used as a legal tool to force proponents to pay attention to migratory species, or it can be used as an invitation to proponents to develop the best possible plans and projects, taking into account the need to sustain populations of migratory species. See landscape approach chapter (4.3) for further recommendations.

² Extensively elaborated in the 2010 book '[Biodiversity in Environmental Assessment](#)', by Sloomweg, Rajvanshi, Mathur & Kolhoff, Cambridge Academic Publishers.

3. ANALYSIS OF 2019 NATIONAL REPORTS TO CMS

CMS COP Decision 13.130 requests Parties to provide information, via their National Reports on measures taken to implement Resolution 7.2 (Rev.COP12) on Impact Assessment and share information on challenges, lessons learnt and needs for further capacity development. The National Report format question X on “*Threats and pressure affecting migratory species; including obstacles to migration*” includes a further comments section on the implementation of specific provisions in CMS COP Resolutions, making reference to Res. 7.2. (Rev.COP12) as the last of 16 mentioned resolutions. This does not give a high profile to impact assessment in the National Report. However, given the nature of questions raised in the NR format, it is expected that relevant information on impact assessment may appear in other sections. This is further explained below.

3.1 APPROACH TO THE ANALYSIS

3.1.1 NATIONAL REPORTS STUDIED

A selection of twenty National Reports was studied in detail. The selection of countries was such that a representative sample of all continents was present, with a focus on mega-biodiversity countries, countries known for migratory terrestrial animals, and including some countries with a longer impact assessment practice. In alphabetical order: Australia, Bolivia, Brazil, Costa Rica, Croatia, Germany, Ghana, India, Kazakhstan, Kenya, Madagascar, Morocco, Netherlands, Norway, Rwanda, Senegal, South Africa, Spain, UK, Ukraine.

A quick search of 25 other national reports was carried out with combinations of search terms related to environmental impact assessment, strategic environmental assessment and landscape approach, including their French and Spanish translations. These included Austria, Bangladesh, Belarus, Belgium, Burkina Faso, Cameroon, Chile, Cote d’Ivoire, Croatia, Czech Republic, Ecuador, Estonia, Ethiopia, France, Georgia, Mozambique, New Zealand, Nigeria, Pakistan, Paraguay, Poland, Saudi Arabia, Serbia, Slovenia, Uganda, Yemen. In total 45 national reports, out of a total of 93, were looked at. It was observed that Asia is underrepresented in the available National Reports.

The analysis below provides a summary on contents. Annex 1 provides reference to reporting of individual Parties.

3.1.2 ISSUES

From the [Resolution 7.2 \(Rev.COP12\)](#), Convention [Article III 4b](#) and [Decisions 13.310-313](#), the following list of issues of relevance to impact assessment has been selected. As these issues are being referred to in overarching Convention documents, it is expected they will be addressed in the National Reports.

- Res, 7.2: “*Prior impacts assessment of project*”. This refers to the use of EIA for projects.
- Res. 7.2: “*Prior impact assessment of programmes, plans and policies*”. This refers to the use of SEA.
- Res 7.2: “*Aspects of relevance for migratory species: migration patterns & ranges*”. This refers to the area of impact that should potentially be covered in an impact assessment study.
- Art III 4b: “*Prevention, remove, compensate for or minimise adverse effects.*” This refers to the application of the mitigation hierarchy, one of the most important principles of impact assessment.
- Decisions 13.130-13.134 *Infrastructure*. This of course defines the infrastructure scope of this report.
- Decision 13.131: “*Collection of best practices examples* “. Good examples are always relevant.
- Decisions 13.131(b): “*Further assistance is needed to enhance the implementation of Resolution 7.2 (Rev.COP12).*” Relevance is obvious.
- 13.133(b): “*Standards / tools applied for impact assessment.*” Relevance is obvious.
- Outline National Reporting format: “*Gaps in implementation of impact assessment and application of landscape approach.*” Relevant additional information.

Based on these issues, sections of special interest were selected from the [CMS National Report Format](#) for more in-depth analysis. Below the selected NR questions in italics, with the motivation why the question could contain relevant information on impact assessment.

V. Awareness. Is any reference made to awareness raising on the role of impact assessment in addressing potential impacts of proposed plans or projects on migratory species? Similarly, are citizens made aware of their rights to have access to impact assessment information?

VI. Mainstreaming migratory species in other sectors and processes. This is considered one of the most important sections since impact assessment is an instrument to assess the impacts of activities in various sectors (e.g. transport, energy, housing) on the environment (including migratory species); in other words, impact assessment is a mainstreaming instrument.

VII. Governance, policy and legislative coherence. Do countries report on adoption of new or adaptation of existing impact assessment regulations, procedures or guidelines and their potential role in addressing migratory species-related issues?

X. Threats and pressures. Known threats and pressures can be addressed in impact assessment, for example in defining the criteria for screening of proposed projects to determine whether they have a legal obligation to do impact assessment or not. Similarly threats and pressures can be addressed in guidance documents or sector manuals. Since this section of the national report also includes a question on implementation of the specific provisions in Resolution 7.2 (Rev. COP12) on impact assessments, one would expect relevant information in this section.

XI: Conservation status. Information for this section may be obtained from impact assessment practice as impact studies can provide new information on conservation status of listed species (including the areas where they reside). Possibly this is being reported?

XII: Cooperating to conserve migration systems. Actions in one country (e.g. dams, wind turbine parks, marine pollution, linear infrastructure obstructing wildlife corridors, etc.) can undermine important biodiversity conservation initiatives in other countries; impact assessment for transboundary issues has a reputation of being difficult as it touches on different authorities and regulatory boundaries. The United Nations Economic Commission for Europe (UNECE) administers the Convention on Environmental Impact Assessment in a Transboundary Context ([Espoo Convention, 1991](#)). It includes the obligation of countries to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries. One would expect reporting on cases with particular impact on migratory species under this heading of international cooperation.

XIII: Area-based conservation measures. This would be the section to report on application of landscape approaches as it refers to land-use planning and landscape management on a wider scale.

XVIII: Knowledge, data and capacity building. Impact assessment is a process to inform decision makers with scientifically sound information. Appropriate data and capacity to implement impact assessments is a constant issue of concern on which reporting may be expected.

3.2 ANALYSIS

3.2.1 GENERAL REMARKS

Little information. Most countries tend to report in a very brief manner, without much explanatory text. This may be understandable given the many conventions for which reports are needed. Apart from the [biodiversity-related global conventions](#) (for animals: CBD, Ramsar, CITES, World Heritage Convention, International Whaling Commission), the reports also refer to many regional conventions and regulations such as the EU Directives and various flyway and regional marine conventions. (Harmonization on reporting between conventions would be useful). As a consequence,

and not entirely unexpected, the amount of relevant information for this analysis was low. Even countries that do provide informative reports only provide very brief information on each topic.

Green sector silo thinking. Reports predominantly focus on activities related to species conservation and protected areas; in other words, green sector projects. Linkages with other sectors or the broader landscape context are hardly made. Illustrative for this green sector focus is the topic of mainstreaming in other sectors: in most reports this is being answered by showing how environmental departments try to integrate the activities for different green conventions. There is hardly a word on coordination with other line departments (e.g. infrastructure), while the question clearly refers to broader contexts such as poverty reduction strategies, and national accounting. The fact that EU member countries (EU SEA and EIA Directives apply to all 28 member states) only occasionally report on the use of these instruments for the benefit of migratory species is a telling sign of green silo thinking. Within the EU, hundreds and maybe thousands of EIA and SEA procedures are carried out annually for infrastructure plans and projects. Many of these will probably address issues of relevance to migratory species. Apparently, these EIA and SEA processes are beyond the horizon of reporters to CMS.

3.2.2 ANALYSIS PER ISSUE

Prior assessment of environmental impacts: EIA or ESIA for projects

Sixteen countries (35%) report on the existence of EIA regulations that can be used in support of migratory species. In one case reference is made to the use of impact assessment for international trade (agreements).

Most countries use the term 'EIA'. Two refer to 'Environment and Social Impact Assessment' (ESIA), a term nowadays commonly used by international development banks and bilateral donors to emphasise the linkages of the biophysical and social environments and the need to have a holistic view on the environment, including human well-being.

Even though all CMS Parties have EIA regulations (see Para 6 in [UNEP/CMS/COP13/Doc.26.4.11](#)), it is clear that the potential use of EIA in the protection of migratory species is not broadly reported on.

Prior assessment of plans: SEA for policies, plans and programmes

Five countries (11%) refer to the existence of SEA as a tool in support of migratory species.

The potential of SEA to support the cause of migratory species is even less recognised than that of EIA. This is partially explained by the fact that many countries have no formal procedures on SEA. On the other hand, from 13 EU countries in the analysis, all having SEA regulations under the EU SEA Directive, only three report on SEAs.

Infrastructure development

Nine countries (20%) report on major infrastructure developments that affect, in one way or the other, migratory species. Offshore and onshore wind turbines is mentioned five times (13%). Other references to infrastructure include industrial development, hydroelectric plants, off shore oil and gas, port extension, and infrastructure facilities in general.

One Party reports on a relevant publication providing guidance on infrastructure,: "[Eco-friendly Measures to Mitigate Impacts of Linear Infrastructure on Wildlife](#)". The document is further elaborated in the chapter 4.

Two (4%) EU countries refer to SEAs being conducted for offshore energy and for infrastructure developments in general.

Infrastructure obviously can affect migratory species and some countries report on it. It is remarkable that recent developments in wind energy get most attention, while traditional (linear) infrastructure development undoubtedly has a much larger global impact. CMS has developed guidance material in relation to wind turbines and underwater noise, which is being referred to. Some of the countries studied are members to the [CMS Energy Task Force](#), which also promotes the guideline materials developed under CMS, AEW, Raptors MOU and Eurobats; see also [CMS Res. 11.27 \(Rev.COP13\)](#).

Application of landscape approach

Eight countries (18%) report on the implementation of projects at the scale and with the intention of what can be regarded a landscape approach. Since the reports only mention projects without explanation it is impossible to provide further analysis. It would be interesting to follow up on these cases with individual countries:

- A policy to improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for mitigation.
- A community based, landscape focussed national programme for the conservation and sustainable use of vicuñas.
- Amazon Sustainable Landscapes Project, aimed at improving integrated landscape management, conservation and connectivity between PAs.
- Community Resource Management Areas concept to expand the critical habitats for migratory species on agricultural landscapes.
- Landscape scale introduced predator eradication.
- Landscape based conservation project (Snow Leopard)
- Transboundary collaboration in Greater Virunga Massif
- Designated areas for migratory species are embedded in the planning system.

Application of the mitigation hierarchy

Two clear examples of mitigation actions were reported:

- An early warning system for wind turbines to protect migratory birds and bats.
- A port expansion required relocation and creation of alternative breeding sites for marine turtles in conformity with EIA and Social Responsibility Agreement.

The mitigation hierarchy starts with avoidance of impacts by alternative design or location. If that is not possible the mitigation of impacts is considered (first example) and if mitigation is not possible compensation (often referred to as offsets) is needed (the second example). In real life most projects are being designed with relatively little attention to environmental impacts. When the design is finalised the (legally required) EIA can do little more than suggest mitigation or compensation measures, unless an external funding body has strong requirements. Early start of EIA during the design phase is therefore called for, to be able to think of alternative design or location taking into account environmental impacts, including migratory species. Project proponents with good intention are more inclined to do so, while unwilling proponents usually see EIA as an administrative hindrance and will treat EIA as an exercise to tick the legally obliged boxes. Needless to say the latter may run into trouble with environmental regulations (when enforced), thus either being confirmed in their opinion about EIA being a hindrance to development, or hopefully being convinced that earlier attention for environmental matters may avoid complications later and speed up procedures.

Aspects of relevance for migratory species: migration patterns & ranges

Two countries provide information on effective mechanisms to specifically address characteristics of migratory species. Single Species Action Plans are said to be effective to focus attention and prioritise activities for the conservation of migratory species. The report does not make the link with Environmental and Social Management Plans or Biodiversity Action Plans that result from impact assessment procedures; impact assessment could, however, provide an effective mechanism to implement such single species action plans.

The ability to include non-Party range states in subsidiary agreements and MoUs is indicated as a significant successful aspect of the Convention without further references to impact assessment in transboundary context. One other member state refers to a requirement of the EU EIA Directive for developments to consider transboundary effects.

Standards / tools applied for impact assessment

Only two Parties report on impact assessment related tools:

- ‘Impact Reduction Plans’, without further explanation.
- EU’s ‘appropriate assessment’ procedure under the Birds and Habitat Directives, integrated in SEAs for infrastructure.

The EU Habitats Directive requires an ‘Appropriate Assessment’ (AA) to be carried out where a plan or project is likely to have a significant impact on a Natura 2000 site (also looking at combined effects with other plans or projects). In EU countries the AA is often integrated in SEA and EIA procedures, but can also be a standalone exercise as its reach is broader than that of SEA and EIA. The terminology ‘plan or project’ is given a very broad interpretation and can include development applications, development plans, local area plans, waste, discharge and other operational licenses and permits.

Best practices examples

Looking at what Parties report as successful in their implementation of the convention, one Party has a remarkable statement: *‘the existence of Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) tools is a success in the implementation of the convention’*. One other Party refers to the use of EIA as a means to mainstream migratory species in formal decision making. Two countries make reference to the use of CMS Guidelines in awareness campaigns on underwater acoustic impacts. One very practical example comes from a small island state where a number of workshops was organised on mainstreaming of biodiversity in EIA, as major development was needed on this small island to replace the natural capital which was destroyed in 1997 by volcanic action.

More broadly it is suggested that integrating environment in sector development strategies can be effective; similarly the legal protection of wildlife crossing corridors in spatial / regional planning frameworks is mentioned. Recognising that SEA can have a fundamentally important role in facilitating such efforts needs further emphasis. Noteworthy in this respect is the report on a Common Environmental Assessment Framework (CEAF) which has been established to facilitate cumulative assessments of impact of large-scale deployment of offshore wind power across Europe. Only one participating country has reported on this; it is unclear what status this CEAF has and how it relates to EIA and SEA regulations.

Several parties refer to the existence of citizen science initiatives and public data portals with information on migratory species. For impact assessment practitioners the availability of data obviously is fundamentally important.

Gaps in implementation of convention

A number of well-known obstacles is mentioned, such as the difficulty in reaching decision makers to include migratory species’ interests in their decisions, the lack of integration of migratory species in instruments for planning and poverty reduction strategies, the difficulty in mainstreaming in other sectors, the difficulty in coordination between ministries within a country and between countries in a region, and the difficulty in managing impacts from development projects in wildlife areas.

Two Parties refer to the implementation of CMS targets in EIAs as a priority for future work.

What further assistance is needed

Four parties provide insight in the needs for assistance. This includes assistance by CMS to the region to strengthen implementation capacity for provisions of the convention; international expert support; support in institutional and technical capacity development, particularly at lower levels of government, including the decentralisation of responsibilities; and more international cooperation and increased private sector involvement.

3.2.3 SUMMARY OF OBSERVATIONS AND CONCLUSIONS ON NATIONAL REPORTS

- The level of detail in the National Reports is limited. Where issues are referred to, it is merely a hint or the mentioning of an issue.

Conclusion: For deeper insights a National Report may not be the appropriate instrument. The NRs do point towards Parties that may be able to provide relevant additional content.

- Reports focus predominantly on activities related to species conservation and protected areas; in other words, green sector activities. EIA and SEA are applied to projects and plans from other sectors which seem to be largely beyond the reporters' horizon.
- A minority of National Reports recognise EIA (35%) and SEA (11%) as tools that can be used in support of migratory species. Only two Parties report on the use of SEA for infrastructure planning.

Conclusion: The above two observations address a core issue of this study – how to effectively cross boundaries between sectors, in this case the 'green' and the 'infrastructure' sectors, preferably making use of available legal EIA and SEA instruments. Even though asked for in the format, boundary crossing is very little visible in the National Reports. Neither is the use of EIA and SEA, but this is less surprising as it has not very clearly been asked for.

- Twenty percent of Parties report on major infrastructure developments that affect in one way or the other migratory species. Remarkably, most of these deal with wind turbines, probably because these are subject of a dedicated CMS initiative of the [Energy Task Force](#) resulting in several guidelines.

Conclusion: Although being one of the global major investment sectors with significant impacts on migratory species, linear infrastructure is not reported on. This was not specifically asked for in the report template, but the template does provide sufficient entry points to report on such highly visible threats to migratory species.

- Integrated approaches at landscape level are mentioned by 18% of Parties, without further information.

Conclusion: Follow up with individual countries on cases on which is being reported could provide relevant information on application of various types of landscape approaches.

- Reporting on the mitigation hierarchy only refers to mitigation and compensation examples; avoidance, the most important priority step in the hierarchy, is absent; a well-known problem in the impact assessment community.

Conclusion: With respect to the mitigation hierarchy, impact assessments are known to have little influence on project location and design to avoid impacts and usually can only mitigate or compensate; strategic assessment of policies and plans that precede the actual projects, considered the best avoidance mechanism, are absent.

- There is very little information on standards and tools to address migratory species in impact assessment; the 'Appropriate Assessment' under EU Habitats Directive is mentioned.
- Best practice examples emphasise the need to integrate environment in sector development strategies and to look at legal protection of wildlife corridors in spatial / regional planning frameworks. The potential role of SEA in such efforts is not referred to, but would need more emphasis.
- A very informative and relevant contribution is a guideline document on eco-friendly mitigation measures to mitigate the impacts of linear infrastructure on wildlife. It does refer to legal EIA procedures; not to SEA.
- Citizen science and public data portals are considered effective tools in support of migratory species by several Parties. Even though not mentioned, impact assessment practitioners are known to make serious use of such information sources.

Conclusion: Publicly available data (including on migratory species), sometimes collected through citizen science projects, is an important development which deserves support and upscaling.

- Identified gaps in implementing the convention refer to well-known obstacles such as the difficulty in reaching decision makers, the lack of integration of migratory species in planning and poverty reduction strategies, the difficulty in mainstreaming in other sectors, the difficulty in coordination between ministries within a country and between countries in a region.
- Four Parties provide insight in needs for further assistance to strengthen implementation of the convention. These include international expert support; support in institutional and technical capacity development, particularly at

lower levels of government (decentralisation); more international cooperation and private sector involvement. Two Parties refer to the implementation of CMS targets in EIAs as a priority for future work.

Conclusion: Avoiding impacts, rather than (partially) mitigating or compensating impacts, by upstream strategic spatial and sector planning is recognised. However, the facilitating role of SEA in, inter alia, creating transparency and defining and comparing alternative, sustainable development options, goes largely unnoticed.

3.3 PROPOSED QUESTIONS IN NATIONAL REPORT FORMAT

Disclaimer: As concluded in the former chapter, a National Report may not be the appropriate instrument for deeper insights as the provided information is short and limited in explanatory text. A focussed effort under the auspices of the new Working Group will probably provide more information.

Where to put these questions? The questions can either be integrated in each section of the National Report (NR), or can be grouped under a separate “Impact Assessment” heading. The advantage of having additional questions in different sections of the National Report is that coherence of the document is maintained. The disadvantage is the dispersal of impact assessment related questions over different sections of the document and the loss of coherence in addressing the topic.

A proposed in-between solution is adding Impact Assessment as a sub-section to section VI of the NR: *‘Mainstreaming Migratory Species in other sectors and processes.’* Motivation for this choice is that EIA and SEA obviously have been created to assess the consequences of proposed activities in all sectors, such as energy, transport, industry, urban development, water, etc. It thus can be considered a legal process instrument to mainstream environment, including biodiversity and migratory species, in other sectors.

Following the [Outline of revised format for the CMS National Reports](#) the following questions are proposed with an explanation of the motivation for each question.

V. Awareness

Awareness on impact assessment processes as a means to conserve migratory species and ensure the sustainability of any use.

- Have activities been deployed to make citizens, NGO’s, civil society organisations aware of their legal rights on access to information, public hearings, or raising of issues in EIA and SEA procedures related to planned developments (notably during the scoping, assessment and review phases of impact assessment procedures)?

Motivation: In many countries impact assessment legislation is one of few legal instruments to obtain information on planned private or public developments prior to realisation. This right of people to be informed is considered a fundamental democratic right, linked to values of free press (e.g. investigative journalism) and the right of people to organise themselves (e.g. civil society action committees in response to a disputed development). It is therefore important that civil society knows about its rights, in order to make effective use of existing environmental procedures.

- Policy awareness: are decision makers and staff of environment ministries with responsibilities for migratory species aware of the opportunities provided by EIA and SEA in addressing migratory species? What do policy evaluations reveal?

Motivation: It is important to assess the actual awareness of National Focal Points for CMS on the potential role of impact assessment in addressing migratory species issues, and their potential role in bringing such issues to the fore during scoping for such assessments. ‘Green’ public administration authorities should play their (legally guaranteed) role in asking for attention to migratory species in impact assessments. Otherwise the issue might be missed out by badly informed line departments.

VI. Mainstreaming migratory species in other sectors and processes

Integration of migratory species and their habitats in formal impact assessment procedures (EIA and SEA)

- Have migratory species been integrated in legal procedures for EIA and SEA? (For example, do Appendix I and II species and their habitats appear in screening criteria for EIA?)
- Is SEA applied to policies, sector and spatial plans? Have migratory species been addressed in these assessments? To what extent?
- Provide examples of EIAs and/or SEAs that have addressed, or overlooked, important migratory species issues and describe their consequences.

Motivation: it is unclear to what extent migratory species are covered by existing EIA and SEA procedures. Simply raising the awareness among Parties that the CMS convention should have consequences for the way in which these procedures are implemented, is a first step in mainstreaming. It is probably too far-fetched to ask for a complete overview of EIAs and SEAs, but examples of good practice and missed opportunities can be a good source of information and inspiration.

A follow up task for the working group could be to collect good practices and translate these into guidance.

VII. Governance, policy and legislative coherence

On accountable, transparent, participatory, equitable and inclusive policy, legislative and implementation processes.

- Do legislation or operational procedures related to impact assessment include formal requirements for the public's access to information and/or its involvement in the different steps of the process?

Motivation: the extent to which civil society has access to EA information differs between countries. To be able to play their role effectively in raising their interests (e.g. migratory species), conservation NGOs, but also community-based organisations, and other stakeholders (incl. neighbouring countries) should, at a minimum, have access to information. The UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the [Aarhus Convention](#)) provides the essential background.

N.B: A follow up task on governance, policy and legislative coherence for the working group would be to compare impact assessment requirements of conventions and study a possible joint effort on reporting. This would include AEWA, Espoo, CBD, Ramsar, CITES, WHC, IWC (see <https://www.cbd.int/brc/>).

X Threats and pressures affecting migratory species; including obstacles to migration

- In what manner have the pressures on migratory species as listed in the table in section X been addressed in the Impact Assessment procedure, for example in screening criteria to determine the need for EA, or in guidance documents or sector manuals? Are any of the mentioned pressures missed in impact studies?

Motivation: the list of threats and pressures is a mixture of direct and indirect pressures at various scale levels. It is virtually impossible for countries to report on this, given the number of Appendix I and II species, the number of threats, and consequently the potential endless listing of issues. One can argue that each Party will have to tick each box. It may be better to have these pressures covered by functional in-country regulations and agreements between countries.

Delete "Resolution 7.2 (Rev. COP 12) on impact assessment" from the list.

N.B: Task for working group: think about a way to translate threats and pressures affecting migratory species into unequivocal screening criteria for EIA at country level. Also think about opportunities for EIAs to identify positive impacts to enhance the protection of migratory species and their needs.

XVIII. Knowledge, data and capacity building

- Are data collections on migratory species accessible to consultants or research institutes involved in the implementation of impact assessment studies? Will the consultants understand the significance and the need to bring in specialist expertise if needed?
- Has a capacity needs assessment on implementation of impact assessment procedures been carried out?

4. STANDARDS AND GUIDELINES

In response to Decision 13.133(a&b), this Chapter provides an overview of existing standards and guidelines addressing the impacts of linear infrastructure, including a gap analysis where it concerns migratory species. The chapter is subdivided into three sections, each section ending with summary conclusions and recommendations.

Section 4.1 addresses International Financial Institutions with dedicated subsections for IFC, World Bank, IADB, EIB and a grouping of four other banks (EBRD, AfDB, AsDB, AIIB).

Section 4.2 presents professional best practice guidance, with subsections for documents with a focus on migratory species (4.2.1), guidance documents with focus on the Infrastructure sector, including green infrastructure and nature-based solutions (4.2.2), and initiatives and documents from other sectors (4.2.3).

Section 4.3 presents recent views on a prominent planning approach for sustainability, the landscape approach, and how this can be used in combination with SEA to better present the cause of migratory species.

4.1 SAFEGUARDS OF INTERNATIONAL FINANCIAL INSTITUTIONS (IFI)

Even though many infrastructure projects are funded from national budgets or commercial banks, international development banks, often referred to as IFIs, play a significant role in the funding of large infrastructure projects. Furthermore, their treatment of environmental issues is for many a benchmark in environmental governance. Virtually all development banks work with safeguard policies that address the environmental, climate, social and other risks associated to loans for projects and programmes. Usually, the first safeguard policy deals with environmental and social assessment, providing the procedural umbrella for the other safeguards. Subsequent safeguard policies deal with well-defined topics such as occupational health and safety, pollution control, or biodiversity. The latter obviously is subject of our attention.

For this analysis the safeguard policies of some of the most prominent IFIs have been analysed. This work builds further on earlier work for CBD (see information document [CBD/SBSTTA/21/INF/13](#)) in preparation of [Decision 14/3](#) on Mainstreaming of biodiversity in the energy and mining, infrastructure, manufacturing and processing sectors (which makes reference to CMS's work on 'Wind Turbines and Migratory Species', 'Powerlines and Migratory Species'; and 'Renewable Energy and Migratory Species'.)

4.1.1 INTERNATIONAL FINANCE CORPORATION (IFC)

IFC is the private sector funding branch of the World Bank. Its [Performance Standard 6](#) (2012) on Biodiversity Conservation and Sustainable Management of Living Natural Resources is regarded by the impact assessment community as one of the most comprehensive safeguards with respect to biodiversity. 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.

With respect to migratory species the following requirements are relevant.

PS 6 is applied to projects (i) located in modified, natural and critical habitats, and (ii) projects that potentially impact on or are dependent on ecosystem services over which the client has direct management control or significant influence. Critical habitats are areas with high biodiversity value, including:

- (i) habitat of significant importance to Critically Endangered and/or Endangered species;
- (ii) habitat of significant importance to endemic and/or restricted-range species;
- (iii) habitat supporting **globally significant concentrations of migratory species** and/or congregatory species;
- (iv) highly threatened and/or unique ecosystems;
- (v) and/or areas associated with key evolutionary processes.

Observation: Category (i) can obviously include migratory species, (ii) not, (iii) specifically focusses on migratory species; categories (iv) and (v) may include habitats that fall within the range of migratory species, but this can only be determined with site specific information. The [Guidance Note on PS 6](#) (2019) further states that PS 6 is guided by and supports the implementation of applicable international laws and conventions, including CMS. Thresholds for Criterion iii are: (a) areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle; (b) areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.

Criterion (v) on key evolutionary processes includes connectivity between habitats (for example, biological corridors) to ensure species migration and gene flow.

In areas of critical habitat, the client will not implement any project activities unless it can be demonstrated that no other alternative project locations exist; the project does not lead to measurable adverse impacts; the project does not lead to a population reduction of endangered species; and a biodiversity monitoring and evaluation program is integrated into the client's management program.

Where 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. Priority ecosystem services are (i) those services on which project operations are most likely to have an impact which result in adverse impacts to Affected Communities; and/or (ii) those services on which the project is directly dependent for its operations (e.g., water). When Affected Communities are likely to be impacted, they should participate in the determination of priority ecosystem services in accordance with the stakeholder engagement process as defined in Performance Standard 1.

Observation 1: Ecosystem services linked directly to migratory species are provisioning services related to taking of species (e.g. fisheries, (trophy) hunting). Migratory species may, however, also be dependent on regulatory ecosystem services that are potentially affected by proposed developments. Regulatory services include a wide variety of processes ranging from seasonal flood regime, erosion and sedimentation rate, fires, soil decomposition, etc. These processes govern the quality of, for example, areas suitable for reproduction, water supply to important migratory species habitat, or other biological processes that are important for the maintenance of valuable habitat. This aspect of ecosystem services is not clearly elaborated in the IFC documents. This is, by the way, a more general observation; regulatory services are often ignored as these have no direct link to human values, yet they are fundamentally important for a good understanding of the functioning of ecosystems and understanding potential impact mechanism.

Observation 2: The CMS Appendix I & II species are not referred to in the IFC PS 6 nor in its guidance note. IUCN Red Lists are the corner stone; all CMS Appendix I & II species have a red-list status. Yet, it is their migratory nature which creates particular requirements for an impact assessment so specific attention to CMS listing is relevant. The concepts of migratory range and migratory patterns is neither referred to.

Observation 3. Mind the indirect impacts! The ecosystem services that support migratory species can be strongly linked to infrastructure development (dams and downstream water supply – see Mara case in chapter 5; hydrological regime of fish breeding areas – see Mekong case in chapter 5; areas that serve as stepping stones – roosting, feeding, breeding - for migratory birds). Similarly, infrastructure development projects may have an indirect effect by opening up areas for (illegal) land conversion and poaching.

Landscape approach: One major focus area in developing the IFC PSs was the consideration of the larger landscape scale. The Performance Standards emphasize the importance of assessing biodiversity and ecosystem services and of

mitigating related impacts on an ecologically relevant scale (sometimes called the “ecosystems approach”), rather than within the artificial boundary of the concession or management area.

Mitigation hierarchy: For the protection and conservation of biodiversity, the mitigation hierarchy includes biodiversity offsets, which may be considered only after appropriate avoidance, minimization, and restoration measures have been applied. A biodiversity offset should be designed and implemented to achieve measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity; however, a net gain is required in critical habitats.

IFC provides several implementation documents on PS 6:

Environmental, Health, and Safety Approaches for Hydropower Projects (IFC, 2018). Construction of dams or certain run-of-river water retention, diversion, and intake structures may physically obstruct upstream and downstream movements of fish and other aquatic organisms. In some cases, recreationally or commercially desirable fish species may concentrate below a dam for feeding or during attempts to migrate upstream. This situation may result in forming a tailwater fishery, but if not properly regulated, these fisheries can result in the collapse of some stocks or the extirpation of a species from the river. Mitigation options to reduce fish losses at hydropower facilities have been developed for some economically important and ecologically migratory species, such as salmon, sea trout, eel, and shad (See Box 4.1).

Box 4.1: Depending on the presence and type of fish species, the following measures can help mitigate the obstruction to fish movements and the potential consequent destruction of natural fish stock:

- Identify migratory fish species, whether anadromous, catadromous, and potamodromous, that will require passage past the dam or diversion structure to fulfil their life cycle requirements, and consider fish passage during the site selection and design stages of the project. Special attention should be paid to regionally or locally important fish stocks or IUCN Red-listed fish species whose long-term sustainability may depend on upstream or downstream passage.
- Research life histories and habitat use of fish species potentially impacted by the hydropower project, particularly in tropical areas where species diversity and endemism are high, and information is limited.
- Ensure consideration of impacts of water storage (reservoir) and peaking operation on fish populations both upstream and downstream of the hydropower project in mitigation planning.
- Provide appropriate mechanisms for upstream fish passage, such as fish ladders, mechanical or hydraulic fish lifts, and trap and transport programs.
- Use appropriate mechanisms for downstream fish passage, such as increased spill (provided that dissolved gas concentrations do not become excessive), bypass channel, and trap and transport programs.
- Provide appropriate fish exclusion or guidance devices for both upstream and downstream passage that will prevent entry of fish into dangerous areas and guide them into bypass facilities. Such fish screens can be a physical mesh or a behavioral screen that uses a deterrent stimulus (such as electrical barriers, strobe lights, bubble curtains, or acoustics). These techniques often divert native nonmigratory species as well, but typically have not been specifically designed to do so.
- Consider use of “fish friendly” turbine technology or construction of bypass structures to reduce fish mortality and injury from passage through turbines or over spillways, especially where large-scale downstream fish migrations occur. Typically, Kaplan turbines are more “fish friendly” than Francis units. Several manufacturing companies are starting to offer greater diversity on design of fish friendly turbines (such as Alden turbines).
- Identify species, life stage, and loss rates of fish and replace losses either directly (such as hatcheries or spawning channels) or indirectly (such as fertilization or stream enhancement).
- Assess critical depths and velocity needed for upstream and downstream movements of indicator species based on fish swimming abilities to assure availability of such characteristics at key stages of the migration cycles.
- Provide lateral river-flood zone movement connectivity through the physical modification of the river bed, the creation of downstream wetlands and shallow areas, and through intentional flood or nonregular ecological flow releases.

- Ensure adequate environmental flows within any low-flow segments downstream of the dam to maintain fish habitat and allow fish to access the fish passage.
- Quantify losses and predict gains in fish populations when required to demonstrate No Net Loss or Net Gains of biodiversity.

Source: *Environmental, Health, and Safety Approaches for Hydropower Projects* (IFC, 2018).

Also addressed in [CMS Res. 11.27 \(Rev.COP13\)](#) on hydro-power: to undertake measures to reduce or mitigate known serious impacts on the upstream and downstream movements of migratory aquatic species, such as through the installation of mitigation measures such as fish passageways or adaptive operations mode and the conservation of regularly flooded areas as nursery and feeding areas nearby the hydroelectric dam.

Good Practices for the Collection of Biodiversity Baseline Data (IFC, 2015): calls for special attention to the spatial scale relevant to biodiversity, particularly for migratory species, for which it may be appropriate for a baseline study to consider other sites utilized by the species along its migratory route. In particular, understanding whether there are functionally equivalent sites outside of the project area of influence (for example, alternative stopover or staging sites for a migratory bird species) can help in impact assessment. Obviously the detectability and abundance of biodiversity values may vary temporally, including time of day, time of month (e.g., in relation to phase of moon), time of year (e.g., local or large scale movements or migration), seasonally, annually, and over periods of multiple year.

IFC has a specially dedicated webpage [A Guide to Biodiversity for the Private Sector](#)

Conclusion: IFC PS 6 pays particular attention to migratory species in one of its criteria for critical habitat, making reference to CMS in its guidance note. Yet, the migratory species impacts of infrastructure projects may go unnoticed when only focussing on the critical habitat criterion (see Mara case in chapter 5). Ecosystem services, particularly regulating services, may be linked to migratory species. This is not highlighted by PS 6, even though ecosystem services are included, which in itself provides an entry point for good impact assessment. Even though ecological connectivity is addressed, the elaboration of concepts from CMS such as migratory range and patterns and Appendix I & II species is not referred to. This is a missed opportunity to provide further detailed guidance on migratory species. The Good practice document on biodiversity data makes proper reference to the need for baseline studies beyond the boundaries of the project area.

4.1.2 INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (IBRD) -WORLD BANK

The IBRD is the government funding branch of the World Bank, in practice simply referred to as World Bank. The structure of the World Bank Environmental and Social Framework ([ESH, 2017](#)) is similar to IFC's Performance Standards. Its [Environmental and Social Standard \(ESS\) 6](#) addresses Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Migratory species are linked to critical habitat, as with IFC PS 6. Where IFC's fifth critical habitat criterion refers to 'areas associated with key evolutionary processes', the World Bank refers to 'ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described' in the four other criteria. This may be read as a reference to regulatory ecosystem services referred to earlier.

However, for unknown reasons the World Bank has decided to leave the concept of ecosystem services entirely out of its ESS 6 on biodiversity. This issue has extensively been discussed in [CBD/SBSTTA/21/INF/13](#). It only makes reference to EES 1 for addressing ecosystem services, but the concept is hardly elaborated in ESS 1 which is a framework requirement for which the other ESSs provide further detail.

In the [ESS 6 guidance note](#) reference is made to migratory species under the 'Precautionary approach' heading: '*Where project screening and scoping indicate that there is good reason to believe that important biodiversity features may be present and could be adversely affected by project activities, key knowledge gaps should be addressed prior to making decisions on whether or how to proceed with those activities. The adage "absence of evidence" is not "evidence of*

absence” is particularly relevant to the question of whether there are unique or endangered species, or evolutionary or ecological processes at a project site. Biodiversity surveys should cover biologically important periods (such as breeding and migratory seasons, and dry and wet seasons), and consider all aspects of the life histories of species of conservation interest.’

Another interesting observation under Conservation of Biodiversity and Habitats is that ‘habitats are three-dimensional and include the biologically active airspace above land or water areas. Some airspaces, such as migratory bird corridors, for example, may be of high biodiversity significance, even if the land underneath them has been highly modified’. Further relevant migratory species reference is made in the section on Biodiversity Management Plans which can address timing of reservoir flushing to avoid harming key fish-breeding activities; or curtailment of wind turbine operation during peak bird migration periods.

Under Additional References the Convention on Migratory Species Appendix I and II Species are mentioned, but without explanation and no reference in the main text.

The World Bank provides additional guidance notes, but none of these are related to biodiversity. The World Bank is said to be in the process of finalizing new implementing guidelines for their standards.

Conclusion: migratory species are treated by the World Bank in a similar way as IFC does. A weakness is the limited attention to ecosystem services in the overall ESS framework, and the total neglect of the concept in its ESS 6 on biodiversity. As with IFC, there seems to be room for further guidance notes, even though the biodiversity topic seems to be largely ignored.

4.1.3 INTER-AMERICAN DEVELOPMENT BANK (IADB)

IADB has recently updated its Environmental and Social Policy Framework ([ESPF, 2020](#)). Again, it is similar to IFC’s system with ESP Standard 1 detailing the impact assessment procedure while additional policies are developed for specific topics, with ESPS 6 covering Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Contrary to the World Bank, the framework makes extensive reference to ecosystem services.

The document has added a section on cumulative impacts which could, among others, specifically have “*interference with migratory routes or wildlife movements*”.

The glossary has an item on ‘Transboundary impacts’ with examples including operations affecting another country’s use of waterways, watersheds, coastal marine resources, **migratory species, biological corridors**, regional air sheds and aquifers.

Under the critical habitat requirement IADB has added a sixth criterion: “*legally protected areas or internationally recognized areas of high biodiversity value, which may include reserves that meet the criteria of the IUCN Protected Area Management Categories I through VI; World Heritage Sites; areas protected under the Ramsar Convention on Wetlands; core areas of World Biosphere Reserves; or areas in the UN List of National Parks and Protected Areas; sites listed in the World Database of Key Biodiversity Areas; or other sites meeting the criteria of the IUCN 2016 Global Standard for the Identification of Key Biodiversity Areas.*”

4.1.4 EUROPEAN INVESTMENT BANK

Starting point of the EIB are European legal standards. The [EIB Statement of Environmental and Social Principles and Standards \(2009\)](#) makes a distinction between countries that are obliged to implement European Directives (EU and Candidate and Potential Candidate Countries) such as EIA, SEA, Birds and Habitat directives and other countries.

For projects in all other regions of EIB activity, the Bank requires that all projects comply with national legislation, including international conventions ratified by the host country, as well as EU standards. Where EU standards are more stringent than national standards the higher EU standards are required, if practical and feasible. In projects for which

the EIB requires a formal EIA, the EIA process and content must be consistent with the requirements of the EU EIA Directive. CMS is described and referred to (also the Bern Convention – the Convention on the Conservation of European Wildlife and Natural Habitats).

The [EIB Environmental and Social Standards](#) (version 10.0, 2018) are structured in line with the other development banks, with a first standard on assessment and management of impacts and risks, followed by nine topical standards, standard 3 being on biodiversity and ecosystems. The biodiversity standard commits itself to eight key principles; the first four are well-known (precautionary principle, early consideration of risks from the earliest possible stage of development, biodiversity-inclusive impact assessment, mitigation hierarchy). Following is a commitment to use an ecosystem approach, the commitment to seek opportunities for biodiversity enhancement, adaptive management and stakeholder engagement.

The EIB defines critical habitats similar to the above development banks, using the following attributes: (i) presence of critically endangered (extremely high risk of extinction), endangered (very high risk) or vulnerable (high risk) species, as defined by the IUCN Red List of Threatened Species and in relevant national legislation; (ii) importance to the survival of endemic or restricted-range species, or unique assemblages of species; (iii) required for the **survival of migratory species or congregatory species**; (iv) required for the maintenance of biological diversity with significant social, economic or cultural importance to local communities; (v) required for the maintenance of ecosystem functioning and the provision of key ecosystem goods and services; and, (vi) key scientific value and/or associated with key evolutionary processes.

The last attribute on key scientific value is unique for EIB. This may include, but is not limited to, exceptional representations of *‘Connectivity between habitats (e.g. **biological corridors**) with importance for species migration and gene flow, which is especially important in fragmented habitats and for the conservation of metapopulations. This also includes biological corridors across altitudinal and climatic gradients and from “crest to coast.”’*

The EIB will not finance a project with significant impacts on nationally or internationally recognised highly threatened or unique species and ecosystems, nor will it finance a project with significant impacts on any UNESCO World Heritage Site.

The Standard requires explicit assessment of alternatives from a biodiversity perspective and their inclusion in any decision on project alternatives. Different alternatives have to be sufficiently analysed with regards to their impacts on biodiversity, ecosystems and their associated services. The reference parameters for such comparisons are the conservation of biodiversity and maintenance of the integrity of habitats. Economic criteria cannot be seen as overruling the ecological criteria.

Special attention should be paid to so-called *‘spill-over effects, sometimes referred to as induced development (development of infrastructure encourages further development, that is not directly connected with the project)’*.

[Guidance Note for Standard 3](#) (2018) on Biodiversity and Ecosystems provides short introductions to various European Directives and relevant international conventions including CMS. It introduces the ecologically appropriate area of analysis (EAAA) as an ecological means to define the spatial scope of analysis. It should encompass wider distributions of potentially affected biodiversity features and the ecological patterns, processes, and functions that are necessary for maintaining them throughout this distribution. EAAAs typically extend well beyond a project’s anticipated physical footprint and may also extend beyond the project area of influence. For some wide-ranging species, the EAAA should incorporate any important areas of aggregation, recruitment, and other habitat features, connectivity or ecosystem processes that are needed to maintain viable populations of the species.

Observation: Even though the guidance note very obviously addresses migratory species, it would be more transparent if migratory species would also be mentioned as a specifically targeted group of species.

The referred to European [Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment](#) and [Strategic Environmental Assessment](#) (both 2013) has a minimal migratory species perspective. It only refers to ‘migration corridors’ as being important for ecological or evolutionary processes, notably in the light of climate

change and the need to provide for corridors for species to migrate with moving climate zones and/or the impact of climate change on migration corridors. CMS is not mentioned.

4.1.5 EBRD / AfDB / ASDB / AIIB

Other development banks are [European Bank for Reconstruction and Development](#) (active in 38 countries across three continents, from the Southern and Eastern Mediterranean, to Central and Eastern Europe, to Central Asia), the [African Development Bank](#), both having performance requirements similar to IFC, and the [Asian Development Bank](#) whose environmental standards from 2003 are presently under review.

The [Asian Infrastructure Investment Bank](#) (AIIB) was recently proposed by China and launched in Beijing in October 2014. The new bank could allow Chinese capital to finance projects and allow it a greater role to play in the economic development of the region commensurate with its growing economic and political clout. Their [Environmental and Social Framework](#) (2016, amended 2019) contains only three standards, on Environmental and Social Assessment and Management, on Involuntary Resettlement, and on Indigenous People. It does contain however biodiversity sections with criteria more or less similar to those of other development banks.

The bank works with an environmental and social exclusion list; the bank will not knowingly finance Projects involving activities prohibited by international conventions relating to the protection of biodiversity resources or cultural resources, such as, Bonn Convention, Ramsar Convention, World Heritage Convention and Convention on Biological Diversity. Many Asian countries, however, are not a Party to CMS.

Migration is not treated in the main text; migratory routes appear in the glossary under the heading “Project area of influence”. Migratory species appear in the glossary under “Critical habitat supporting globally or nationally significant concentrations of migratory or congregatory species.”

4.1.6 CONCLUSIONS ON IFI SAFEGUARDS

- Procedurally migratory species do appear in the safeguards of IFC, World Bank, EIB, IADB, EBRD, AfDB, ADB, AIIB, as one of the defining characteristics of critical habitat; such habitat should support globally significant concentrations of migratory species and/or congregatory species. In supporting guidance documents the critical habitat criterion is further developed for practical use; here the migratory species knowledge is limited.
- Intrinsically, threatened migratory species are addressed by the Red List criterion. Yet, the migratory nature of species creates particular requirements for an impact assessment (for example on geographical and temporal scale of assessment). Migratory species should thus draw special attention, which it presently does not do in a sufficient manner.
- Ecosystem services that support the maintenance of areas important for migratory species may go unnoticed. The focus of safeguards is on ecosystem services directly linked to human values. So for example, provision of water for irrigation or public water supply is an ecosystem services on which the safeguards will be triggered; water supply to maintain downstream ecological processes may go unnoticed (e.g. floodplain regime, fresh/salt water balance in a delta, etc.). On the other hand, most standards refer to essential ecological processes or ecosystem functions. Yet, the linkage to migratory species is not made.
- As with biodiversity in general, unprotected and non-threatened migratory species run the risk of being ignored as they are considered common. Yet, if we want to maintain a functional earth, the conservation of common biodiversity is vital, particularly in relation to the continued provision of ecosystem services on which humanity depends. Ecosystem services are more often than not maintained and guaranteed by ‘common’ species. CMS listed species, if not protected, appear in agreements and/or action plans to manage the populations such as under the auspices of CMS. These should not be ignored in EIA, but if the criteria in a safeguards policy does not trigger attention to these species, the risk of oversight is real.
- IFI safeguards are focussed on doing no harm, even though some refer to the intention to enhance biodiversity (do good) if possible. The most these safeguards can accomplish is to reduce the rate of biodiversity loss. For actually

improving the situation of migratory species, more is needed. This obviously relates to the global transitional change needed to stop further decline of “system earth”.

- Among the bank documentation there hardly is any guidance material addressing migratory species. The best example comes from IFC addressing migratory fish in hydropower dam projects.

Recommendations:

- Particularly IFC, but also other IFIs provide supporting documents, which may include topical or geographically focussed documents and best practice cases. Since all banks require special attention to migratory species, additional guidance on migratory species would be the easiest step to enhance the implementation practice for migratory species. This should be a globally applicable document addressing all groups of migratory species. A summary overview of all available CMS documents with an instruction, linked to IFC requirements, on how and in what circumstance to use each document would make a good start (see for example the CMS document [Information Resources](#) for the Renewable Energy sector, or the global CMS migration atlas which is in preparation). A globally applicable document for terrestrial migratory species, comparable to the Guidelines for Addressing the Impact of Linear Infrastructure on Large Migratory Mammals in Central Asia, with additional information on appropriate research methodologies for (functional) groups of migratory species, is still needed (see next section). A combination with the earlier recommendation on the drafting of guidelines on screening and scoping for migratory species (see chapter 2) seems obvious.
- Appendix I and II listed species are protected under CMS, but may not be protected nationally or not considered threatened. The protected status under CMS is not reflected in the safeguards of development banks, so may go unnoticed. This needs to be corrected through for example the additional information document described above.

4.2 PROFESSIONAL BEST PRACTICE AND GUIDANCE

4.2.1 GUIDANCE FOCUSED ON MIGRATORY SPECIES AND/OR HABITAT CONNECTIVITY

CMS in collaboration with partners has produced a number of relevant documents. Most importantly are those produced by the [Energy Task Force](#) on renewable energy and powerlines. As explained in the introduction these are not treated in this report, to avoid duplication. It has to be noted though, that during the survey of the biodiversity, infrastructure and impact assessment communities the outputs of the ETF have not been encountered. This may be caused by the sector-specific nature of the documents, but may also be caused by the fact the products remain “hidden” on the CMS website with too little global outreach in the infrastructure, biodiversity and impact assessment communities.

[Guidelines for Addressing the Impact of Linear Infrastructure on Large Migratory Mammals in Central Asia](#) (2015) by UNEP/CMS Secretariat, Wildlife Conservation Society. An excellent document focussing on migratory large mammals in Central Asia. It provides detailed information on types of migration, relevant species, and a description of the potential impacts of 5 major types of linear infrastructure (Note: it should be used in combination with the Central Asian Mammals Migration and Linear Infrastructure Atlas - [CMS Technical Series No. 41](#)). Furthermore, it does a significant effort to provide legal and policy entrances to defend the interests of migratory species in relation to large infrastructure works, including the role of EIA and SEA. It provides guidance on reducing the impact of linear infrastructure, not only from a construction perspective (such as over/underpasses) but also planning and design principles (e.g. strategic planning and landscape approach), assessment principles (e.g. public participation, cumulative effects, etc.). Obviously the document is limited in scope: geographically by focussing on Central Asia, biologically by focussing on large mammals only. It does not address research methodologies on migratory species that are suitable for impact assessment.

[Eco-friendly Measures to Mitigate Impacts of Linear Infrastructure on Wildlife](#) by the Wildlife Institute of India. Provides very practical structural and non-structural solutions for functional groups of wildlife in India (large herbivores, amphibians, bird, etc.) to avoid roads, railways and powerlines. As the title says it is focussing on mitigation measures of planned and existing linear infrastructure. (See also [this presentation](#) by the main author). The scope of this document

is limited in geography (South Asia) but relatively broad in types of migratory species. The functional group approach is smart as it can differentiate for example between mammals moving over land (elephants) or through canopies (monkeys); both require entirely different measures. It refers extensively to available scientific and guidance publications.

[WILDLIFE AND TRAFFIC. Habitat Fragmentation due to Transportation Infrastructure: A European Handbook for Identifying Conflicts and Designing Solutions](#) (2003) by the Infrastructure and Ecology Network Europe ([IENE](#)). A very informative document on how to address habitat fragmentation by transport infrastructure, making use of existing SEA and EIA instruments, how to integrate linear transport infrastructure into the surrounding landscape, monitoring requirements, etc. It provides a wealth of examples on fauna passages and other technical solutions. It includes an annex with country specific, local language guidelines, all European.

IENE also provides a [Transport Ecology Guidelines Portal](#) to many more relevant documents, such as

- IUCN (2020) [Guidelines for conserving connectivity through ecological networks and corridors](#). (See section on Green Infrastructure).
- [Railway ecology](#) Luís Borda-de-Água, Rafael Barrientos, Pedro Beja, Henrique M. Pereira (2017, 320 pp.) Springer.
- Several country specific documents (Europe only)

More recently IENE (2018) published [Towards developing sustainable Linear Transportation Infrastructure globally. Recommendations for priorities of international action](#). The title suggests more than the relatively superficial document provides. It is focussed on industrialised contexts and on mitigation measures. The table below provides the principles for environmentally friendly transportation infrastructure.

Table x: IENE Principles for Environmentally Friendly Transportation Infrastructure

1. **Strong legal framework:** Establishment and strengthening of a legal framework for sustainable linear infrastructure development.
2. **Sustainable strategic planning:** Sustainable strategic planning for development of any major transportation infrastructure project.
3. **Ecosystem approach:** Adoption of ecosystem approach on crossing points of Grey and Green Infrastructure evaluate the values of Natural Capital and ecosystem services.
4. **Any case, a unique case:** Establishment of the “any case, a unique case” estimating any problem as unique problem and evaluating the use of existing solutions without the absolute and blind “copy paste” implementation.
5. **Multi-disciplinary cooperation:** Establishment of multi-disciplinary cooperation among different professionals such as engineers and environmentalists.
6. **Civil society involvement:** Involvement of civil society in the planning phase of linear infrastructure projects.
7. **Polluter pays principle:** Implementation of the “Polluter pays” principle, after clarifying the ethical and transparency concerns, by including concrete mitigation measures right from the beginning of the planning phase until the tendering and contracting of the building and operating phases.
8. **Long life effective maintenance:** Inclusion of maintenance of mitigation measures in the budget of the ordinary program for maintenance of the infrastructures under operation.
9. **Environmental supervision:** Inclusion of environmental supervision of technical features of the infrastructure and monitoring of the habitat and wildlife populations’ status in all phases of the projects from design to full operation.
10. **Culture of learning:** Establishment of a culture of learning to build up and support continuous evaluation and exchange of knowledge and experience between the interested, relevant and authorized organizations and state services.

ICOET conferences: the International Conference of Ecology and Transportation, a bi-annual conference since 2005. ICOET is an interdisciplinary, inter-agency conference addressing the broad range of ecological issues related to transportation systems in all modes. At their [September 2021 conference](#) ICOET will host the "Global Congress on Linear Infrastructure and the Environment," which will bring together decision-makers, scientists and technical experts from

around the globe to discuss the pressing issues associated with developing more sustainable linear infrastructure systems.

The topics are pertinent for CMS. To name a few from the indicative list of some 30 topics: Aquatic species/ecosystem and wetland interactions; Decommissioning or repurposing existing infrastructure; Enhancing infrastructure systems for net ecological gain; Linear transportation beyond roadways (railroads, pipelines, transmission lines, etc.); Mainstreaming ecology in transportation planning and program delivery; Mitigation / Restoration; Terrestrial wildlife and ecosystem interactions; Trends across transportation modes (rail, air, sea, land, mass transit, bike/walk); Wildlife movement: connectivity, safety.

Further sources of information:

- [International Forum on Sustainable Infrastructure](#): Integrating Climate Resilience and Natural Capital into Transport Infrastructure Planning and Design, Ha Noi, Viet Nam 16 to 17 May 2017.
- The academic field of transport ecology or road ecology has produced a significant body of literature. See for example [this Handbook of Road Ecology](#), and [this best practice presentation](#) on wildlife-friendly infrastructure with three messages: 1. Identify the specific impact(s) of concern; 2. The impact has probably been mitigated somewhere else in the world, and 3. Don't 're-invent the wheel' – use existing guidance! (for example this [collection of guidelines](#)). No further inventory has been made of this field of expertise.

4.2.2 GUIDANCE FROM INFRASTRUCTURE SECTOR

[G20 Principles for Quality Infrastructure](#) : G20 has defined a set of voluntary, non-binding principles that reflect the common strategic direction and aspiration for quality infrastructure investment, with the aim of pursuing quality infrastructure investment to maximize the positive economic, environmental, social, and development impact of infrastructure. Infrastructure investment should be guided by a sense of shared, long-term responsibility for the planet consistent with, among others, the 2030 Agenda for Sustainable Development.

One of the urgent messages from this G20 work is the warning to avoiding lock-in of polluting, environmentally-harmful infrastructure, and stranded assets. Most existing infrastructure was designed and built for a world in which fossil fuels were cheap and abundant. Given the long lifespan of infrastructure, failure to invest in clean, sustainable and resilient infrastructure in the next 10 to 15 years would either lock countries into an unsustainable greenhouse-gas-intensive development pathway or risk stranding many assets. It would also imply serious and probably irreversible risks, not only of environmental damage, but also of financial instability that harms economic growth prospects. Infrastructure also has potential impacts on biodiversity which may threaten the provision of ecosystem services (e.g. resilience). Mainstreaming biodiversity into infrastructure investment decisions can contribute to the achievement of biodiversity conservation ([OECD, 2019](#)).

Examples of possible measures to help minimise the environmental impacts of infrastructure and avoid lock-in include:

- Rethinking planning at all levels of governments to align current infrastructure project plans with long-term climate and development objectives, as well as biodiversity goals.
- Establishing a pipeline of infrastructure projects that are consistent with long-term, low-emission and climate-resilient development strategies, reconciling short-term action and long-term decarbonisation goals, as a means to shift investment to low-emissions, climate-resilient infrastructure.
- Analysing and studying different alternatives for the development of infrastructure investment projects to determine those that are environmentally viable, have lower costs, and have greater returns and social benefits.
- Using impact assessment and management as part of planning, decision-making and ex post monitoring processes for all projects, plans and programmes having a potentially significant impact on the environment.
- Making the results of impact assessment transparent to investors in compliance with local laws and regulations to further promote green financial markets.

- Ensuring spatial and land-use planning instruments are geared to minimise the environmental impacts of infrastructure, and help meet environmental objectives, including on biodiversity.

Migratory species is not referred to.

Global Infrastructure Hub: This platform is one of the initiatives under the G20, aiming at providing connections in the infrastructure community, provide best practice tools and share information, and accelerate discussion towards better and sustainable infrastructure. It provides a searchable Infrastructure Knowledge Exchange; it provides very little guidance material on biodiversity (only the EIB ESS 3 on biodiversity); nothing on migratory species.

Sustainable Infrastructure Partnership: UNEP launched the [Sustainable Infrastructure Partnership](#) (SIP) in 2018 as a platform to promote and support integrated approaches to sustainable infrastructure planning and development. The SIP also coordinates UNEP's implementation of UN Environment Assembly (UNEA) [Resolution 4/5 on sustainable infrastructure](#). As part of the implementation of the Resolution 4/5, UNEP has convened an Expert Working Group to take stock of existing normative guidance on sustainable infrastructure, identify gaps, and develop consolidated, streamlined, internationally applicable [Good Practice Guidance Framework for Sustainable Infrastructure](#) (2020) focusing on upstream, systems-level approaches, complemented by best practice case studies. The draft version is a generic document structured around 10 guiding principles of which one addresses biodiversity. Migratory species is referred to once under the heading of transnational impacts. It does not have any reference to any biodiversity convention; cases are still lacking. It has also developed a short policy brief for CBD COP 14 (2019): [Mainstreaming Biodiversity In The Infrastructure Sector: Fostering system-level approaches](#), also focussing on the need for strategic approaches and application of strategic environmental assessment as early in the planning cycle as possible.

The International Transport Forum (ITF) at the OECD is an intergovernmental organisation with 62 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. ITF is the only global body that covers all transport modes. It has, among many other documents, produced [International Best Practice on Strategic Infrastructure Planning](#) without any attention to biodiversity; it also has a (relatively old, 2000) document on [SEA in Europe](#) with some attention to biodiversity. Most environmental documents are related to climate change and emission reduction. The ones that refer to biodiversity are all related to European Directives, which include requirements on migratory species.

All development banks have dedicated websites for (sustainable) transport activities: [World Bank](#), [Asian Development Bank](#), [IFC](#), [EIB](#) as a few examples. These have not been further analysed on biodiversity / migratory species examples. In 2015 the World Bank published [Improving Environmental Sustainability In Road Projects](#) with limited attention to biodiversity. The Inter-American Development Bank published a document titled "[What is sustainable infrastructure?](#)" with very limited attention to biodiversity (nothing on migratory species).

Green infrastructure is a strategically planned network of high quality natural and semi-natural areas with other environmental features, designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban setting ([European Commission, 2013](#)). Green infrastructure thus can be both natural or man-made and can include measures to provide corridors for the movement of species. Such networks of ecologically connected (semi-)natural areas contrast to "grey" or built infrastructure which creates problems and conflicts of interest where green and grey infrastructure are crossing (IGELI project, 2028). IUCN has published [Guidelines for conserving connectivity through ecological networks and corridors](#), with extensive reference to the interests of migratory species.

Nature-based solutions is a rapidly upcoming field, particularly in relation to climate adaptation. It refers to the sustainable management and use of nature for tackling socio-environmental challenges ([here a very informative wiki with many links](#)). The challenges include issues such as climate change, water security, water pollution, food security, human health, and disaster risk management. Nature-based solutions bring nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions". In 2020, the [EC definition](#) was updated to further emphasise that "nature-based solutions must benefit biodiversity and support the delivery of a range of ecosystem services". This provides potential linkages with the interests of migratory species.

4.2.3 OTHER SECTOR INITIATIVES

The [International Hydropower Association](#) has developed [Hydropower Sustainability Guidelines](#) on Good International Industry Practise with attention to biodiversity, including terrestrial and aquatic migratory species. It also has a [Hydropower Sustainability Assessment Protocol](#). The Assessment Protocol covers all stages of a project's lifetime: planning, preparation, implementation and operation. The background document pays extensive attention to biodiversity issues, including migratory species (terrestrial and aquatic), but from a procedural point of view. Issues are highlighted, but technical studies are expected to be implemented by experts.

The [International Council on Mining and Minerals](#) has dedicated activities on [biodiversity management](#), including its [Good practice guidance for mining and biodiversity](#) (2006) with consistent attention to migratory species, albeit in a general sense.

The [Cross Sector Biodiversity Initiative](#) (CSBI), a partnership between ICMM, [IPIECA](#) (the global oil and gas industry association for advancing environmental and social performance) and the [Equator Principles Association](#) (a risk management framework, for determining, assessing and managing environmental and social risk in projects adopted by 114 financial institutions in 37 countries) has developed '[A Cross-Sector Guide for Implementing the Mitigation Hierarchy](#)' (2015) with extensive attention to and case examples of migratory species. Yet, the migratory aspect is treated in a general sense. The associated [Timeline Tool](#) provides a practical roadmap to identify milestones and key interdependencies between project development schedules, financing timelines and the actions required to apply the Mitigation Hierarchy effectively. The point of departure of this work is the IFC Performance Standard 6 on biodiversity.

IPIECA has also published [Biodiversity and ecosystem services fundamentals](#) (2016) for the oil and gas industry in collaboration with the International Association of Oil and Gas producers (IOGP). In 58 pages the word migratory or migration does not occur! Rather a serious omission for a biodiversity document.

The **Biodiversity in Impact Assessment** community has, apart from the earlier mentioned CBD Guidelines on Biodiversity in EIA and SEA, produced other relevant infrastructure-related documents. An early EIA focussed work from 2000, with a focus on the UK is [Biodiversity and Environmental Impact Assessment: A Good Practice Guide for Road Schemes](#). It is somewhat outdated. From Sweden another example of road ecology in impact assessment ([2014](#) & [2015](#)), referring to both EIA and SEA, concludes that the treatment of ecological impacts has improved substantially over the years, but problems remain with the treatment of **fragmentation** and the definition of the impact assessment **study area**, generally delimited without consideration for the scales of ecological processes. The authors recommend improved guidelines for spatial and temporal delimitation.

The IAIA 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.
- 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.

All the above biodiversity focussed documents pay good but generalised attention to migratory species, making distinction between terrestrial, aquatic and avian migration.

Another rapidly developing field of relevance is **citizens science and biodiversity data portals**. EIA studies need and collect large amounts of data. The last decade has seen a significant improvement in online access to biodiversity data. Several global data portals exist:

- The [Global Biodiversity Information Facility](#). Coordinated through its Secretariat in Copenhagen, the GBIF network of participating countries and organizations, working through participant nodes, provides data-holding institutions around the world with common standards and open-source tools that enable them to share information about where and when species have been recorded. This knowledge derives from many sources, including everything

from museum specimens collected in the 18th and 19th century to geotagged smartphone photos shared by amateur naturalists in recent days and weeks.

- The [Integrated Biodiversity Assessment Tool](#) (IBAT) is designed to facilitate access to accurate and up-to-date biodiversity information to support critical business decisions. The tool is a partnership between BirdLife International, Conservation International (CI), IUCN and World Conservation Monitoring Centre (UNEP-WCMC). IBAT is based on three globally authoritative datasets: Protected Areas, Key Biodiversity Areas and The IUCN Red List of Threatened Species.
- The European Environment Agency hosts the [Biodiversity data centre](#) (BDC) providing access to data and information on species, habitat types and sites of interest in Europe and to related products for biodiversity indicators and assessments and the [Biodiversity Information System for Europe](#) (BISE), a database of all relevant European biodiversity data sources. It is a good source of indicators and maps collated from across European institutions.
- At country level numerous initiatives exist to collect available data, by scientific institutes and/or through citizen science initiatives, in accessible databases; see the earlier observations from the National Reports.

No attempt is made to see whether migratory species are well represented and identified as such in these data portals.

4.2.4 CONCLUSIONS AND RECOMMENDATIONS ON PROFESSIONAL BEST PRACTICE AND GUIDANCE DOCUMENTS

Available knowledge. There is a serious body of knowledge and expertise on the topic of mitigating habitat fragmentation by linear infrastructure. This report only touches the issue by referring to non-scientific guidance documents. Within the scientific community, for example in the area of road or transport ecology, there is much, much more. The advice not to re-invent the wheel, must be taken seriously.

Recommendation: CMS Secretariat or members of the working group are advised to participate in the upcoming (fully digital) International Conference of Ecology and Transportation or similar events, to establish contacts with relevant players in this community.

“Upstreaming”. The mitigation hierarchy, however, requires to first study avoidance options. This is a much less developed field, particularly in relation to the need for more strategic spatial and sectoral planning, and the role of SEA in such endeavour. The G20 Quality Infrastructure initiative, very influential in the infrastructure donor community, provides a broad perspective on the consequences of a real transition towards sustainability. It addresses at the highest policy level the need to minimise environmental impacts of infrastructure and to avoid lock-in in unsustainable investments. It does not address migratory species as such, but it does provide entry points for the mainstreaming of biodiversity. A similar call for more focus on upstream, systems-level approaches comes from UNEP’s Sustainable Infrastructure Partnership.

Recommendation: The G20 recommendations are not focussed on migratory species, but they very clearly show the changing perspective in the world of infrastructure and the opportunity it provides for a green transition. CMS should, probably in collaboration with other Biodiversity conventions, feed information into and put itself on the agenda of this very influential and agenda setting initiative supported by G20, IMF, OECD, EU, and G20 member countries. Relevant information material and good practice cases to make the case for biodiversity and migratory species can be accommodated by the Global Infrastructure Hub. Biodiversity is seriously underrepresented at the moment. Similarly, relevant information material and good practice cases is needed for the Sustainable Infrastructure Partnership, the International Transport Forum, and as stated earlier, with the development banks.

Green infrastructure and nature-based solution are two closely related and rapidly developing fields, particularly in relation to climate mitigation and adaptation. The relevance for biodiversity is obvious.

Recommendation: Develop ideas and guidance on how migratory species interests can be integrated into nature-based solutions. Contact active platforms such as the [PEDRR](#) clearinghouse for knowledge, training, advocacy and practice on Ecosystem-based Disaster Risk Reduction (Eco-DRR) to see how this information can feed into such initiatives. Similarly,

EcoShape's very practical [Building with Nature](#) initiative is interesting, promoting the concept of hybrid engineering: green where possible, grey where needed. (There is much more; see [wiki page](#)).

Good **biodiversity guidance** is produced for several sectors, notably in the hydropower, mining and energy sectors. Aspects related to migratory species are globally applicable and of general nature (e.g. fish, bird, terrestrial animals), with individual species as example cases. Whether these guidelines are followed in practice is difficult to know and has not been further analysed (see [CBD/SBSTTA/21/INF/13](#) for further information).

The impact assessment community has also produced relevant biodiversity guidance material paying good but generic attention to migratory species. Additional information on migration requirements for better defined (groups of) migratory species would be an add-on to existing guidance.

Recommendation: A more systematic treatment of all (groups of) migratory species from Appendix I and II, for example, by using the concept of functional groups, would provide a relevant add-on to the existing information. Freshwater species are underrepresented at CMS, but are considered an important topic when assessing the fragmentation impacts of (hydraulic) infrastructure.

An increasing number of international and country level **biodiversity data portals** are being developed. Open access to such data portals is extremely relevant for good impact assessment practice. It is unclear if and how migratory species are being addressed in such databases.

Recommendation: Assess the status of migratory species in global databases and, if necessary, suggest appropriate adaptations. Provide guidance for countries to develop their own databases making, for example, use of citizen science initiatives.

Visibility of CMS outputs in the impact assessment and infrastructure community is low, yet the information is highly relevant.

Recommendation: reach out to other global communities, notably the infrastructure and impact assessment communities, highlight the existence of available documentation, and find procedural entry points where the information can feed into planning and assessment processes. Redesign the information in such manner that it is fit for purpose.

4.3 PLANNING TOOLS: THE LANDSCAPE APPROACH

4.3.1 INTRODUCTION

The 21st century presents humanity with the dual challenge to protect nature and to create an equitable home for people living on a finite planet. The need for sustainable landscapes as a source of multiple social, economic and environmental benefits is acknowledged in international policy agreements. Protecting nature as part of productive, sustainable and resilient landscapes is becoming (finally!) a centre piece in the sustainability transformation agenda. Obviously, migratory species are part of this.

In recent years, landscape approaches have gained traction in the conservation and development arena. Achieving long-term economic, environmental and social goals increasingly depends on understanding and accounting for the impact of land management decisions on ecosystem goods and services, and developing a more coordinated and integrated approach to natural resource management on a larger scale. From the guidance documents section above, it is clear that also the infrastructure community is becoming aware of this.

The scientific literature on the landscape approach can be traced back to the ecosystem approach as adopted by the Convention on Biological Diversity ([Decision V/6](#), 2000) with further guidance in 2004 ([Decision VII/11](#)). The Ecosystem Approach is based on the application of appropriate scientific methodologies focussed on levels of biological organisation, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognised that humans, with their cultural diversity, are an integral component of many

ecosystems. In practice the 12 Principles of the Ecosystem Approach were found to contain two major weaknesses (Shephard, 2008). Firstly, they do not address in any way the institutions through which ecosystem management stands or falls. Secondly, the impact of markets and other economic forces is under-recognised. Both these weaknesses were thought 'to grow out of the fact that those who developed the 12 Principles were most familiar with protected areas, where there is only one managing institution and where market forces are largely held at bay' (Shephard, 2008).

The term landscape approach was introduced by Sayer et al. (2013) in their seminal paper '[Ten principles for a landscape approach to reconciling agriculture, conservation, and other competing land uses](#)'. In their reasoning 'landscape approaches seek to provide tools and concepts for allocating and managing land to achieve social, economic, and environmental objectives in areas where agriculture, mining and other productive land uses compete with environmental and biodiversity goals'.

The proliferation of landscape approach terminology and products has led to confusion on what a landscape approach represents, how different concepts, frameworks and tools relate to each other. Many people think, or say, they are working at the landscape level or with a landscape approach. Yet, there is quite some confusion on the actual meaning of such statements.

For clarity the following definitions are provided by Denier et al. (2015) in [The Little Sustainable Landscapes Book](#):

'A landscape is a socio-ecological system that consists of natural and/or human-modified ecosystems, and which is influenced by distinct ecological, historical, economic and socio-cultural processes and activities'. Or even shorter but still adequate by Sayer et al. (2013) in their [Ten Principles](#) paper: A landscape is 'an area delineated by an actor for a specific set of objectives'.

A Landscape Approach is 'a conceptual framework whereby stakeholders in a landscape aim to reconcile competing social, economic and environmental objectives. It seeks to move away from the often-unsustainable sectoral approach to land management. A landscape approach aims to ensure the realisation of local level needs and action (i.e. the interests of different stakeholders within the landscape), while also considering goals and outcomes important to stakeholders outside the landscape, such as national governments or the international community. A landscape approach may be undertaken by one or more stakeholders who engage in actions independently, or by multiple actors as part of a collaborative, multi-stakeholder process. This multi-stakeholder process is referred to as integrated landscape management' ([Denier et al, 2015](#)).

The above definition may suggest that a landscape approach, by definition, has to deal with all potential issues in a landscape. This can only, realistically, be applied to regional spatial/development planning. Usually this is not the case as one major issue creates the trigger for concern and action; in this document it is the development of linear infrastructure, for whatever purpose, which raises concerns over migratory pathways of terrestrial animals. A landscape approach can in such case start with a sector-defined issue (a proposed road or railway line), but provide guarantees that all relevant interactions with other sectors and stakeholders are taken into account.

Therefore, the short definition for landscape approach by [Sayer et al. \(2017\)](#) may be more appropriate: 'A long-term collaborative process bringing together diverse stakeholders aiming to achieve a balance between multiple and sometimes conflicting objectives in a landscape or seascape.'

On the **scale** at which a landscape approach has to be applied Denier et al. (2015) say that 'the landscape approach usually limits itself to a scale that is small enough to guarantee a degree of manageability, but large enough to include all ecosystem services and stakeholders potentially affected by the issue at stake'. Boundaries thus are defined by the issue at stake, agreed upon in consultation with all stakeholders. For migratory species this obviously may create difficulty in defining the area to address, having to deal with administrative, often international boundaries.

Conclusion: Landscape is a suitable term that covers a complex, multifunctional space, including its stakeholders and institutional management arrangements. The exact meaning of landscape approach is subject to (academic) debate, but Sunderland in a weblog (['Landscape approach' defies simple definition — and that's good](#)) provides an optimistic

view: *‘there may not be a widely agreed definition for ‘landscape approach’, but there is a strong consensus on what it means’*. The next chapter provides a glimpse.

4.3.2 SORTING OUT LANDSCAPE APPROACHES

Despite a wealth of literature on landscapes and land landscape approaches, ideas relating to landscape approaches are diverse and often vague, resulting in ambiguous use of terms. Freeman et al. (2015) did a commendable attempt to classify existing approaches in three types of landscape approaches and further define three dimensions in describing a landscape approach.

Types of landscape approaches. In the many different interpretations of the landscape approach, three main types can be distinguished:

Using a landscape scale only: it departs from the biophysical boundaries of a landscape and does not include participatory nor interdisciplinary processes. It aims at understanding patterns and processes at landscape scale. Landscape boundaries are defined by biophysical boundaries only; social-economic and institutional boundaries are not taken into account. This is not what is considered a landscape approach, although it can provide useful insights, especially when looking at interactions between physical infrastructure interventions and migratory species. By adjusting assessments to the scale needed to understand migratory processes, much gain in the quality of assessment can be made.

Sectoral landscape approach: starts from a primary goal (mono-sectoral); many landscape approaches may start with a sectoral focus but evolve, in response to challenges encountered, to incorporate other objectives and thus develop characteristics of an integrated landscape approach. Landscapes are (by definition) multifunctional, so other sectors and their stakeholders have to come on board. Depending on the complexity of the landscape this can be relatively simple or more complex. The simplest form is the interference of one mono-sector plan with conservation objectives in the landscape. Usually there are interactions with multiple other sectors and stakeholders, so the approach may develop naturally into the third category. For example, a proposed transport corridor will create a barrier to migratory species, but may also cut through communities, take productive agricultural land, or lead to settlement of migrants. Impact assessment can facilitate the identification of affected stakeholders. Inviting these stakeholders into a planning process is not something that impact assessments can impose, but authorities willing to do a good job can easily integrate the principles of a landscape approach into an impact assessment process. The willingness and ambition of the leading actor(s) in the process is critical.

Integrated landscape approach: the ‘real’ landscape approach. Even though the start of a process may be sectoral, the interference with other resource users and conservation goals should ideally lead to an integrated³ landscape approach. An aspect well developed in impact assessment but entirely neglected in the landscape approach literature is good scoping; what are the really important issues to take into account. Such scoping is, of course, part of a participatory decision. Scoping is a fundamental part of impact assessment procedures, designed to focus assessments on the most relevant issues and keep such studies under control (in terms of time and money expenditures).

Conclusion: Referring to a ‘Landscape Approach’ does not provide much information on what is actually meant. An integrated landscape approach is considered as the preferred way to deal with issues at landscape scale, but in everyday reality of countries organised along sector interests (transport, energy, mining, health, nature, etc.) very often the starting point for a landscape approach lies in a sectoral landscape approach. Good application of the principles of the integrated landscape approach may pull the process out of its sector silo, if actors with decision making powers are willing to do so.

Dimensions of a landscape approach. Freeman et al. (2015) also observed that scientific papers focus on three different dimensions of landscape approaches; any landscape approach can be elaborated for each dimension:

³ Integrated here means: taking into account the interests of various sectors, different (groups of) stakeholders and actors, different levels of government.

- **Conceptual frameworks:** simplification of reality, for understanding and explanation. Theoretical basis or model for an approach.
- **Principles:** generalised points of departure on which the approach is based. Can be applied in a range of different contexts; often a mixture of theoretical and applied science.
- **Process:** practical guidance on how to implement the process, usually in a set of specific steps that should be followed. While process steps can be defined in generic terms, the actual content of each step by definition is location-specific.

Scientific publications mainly deal with the first and second dimension while the dimension of implementation process has predominantly been developed by the international NGO community (See [this CMS case](#) of successfully bridging the science-implementation gap in South Africa).

4.3.3 INTEGRATING LANDSCAPE APPROACH INTO SEA

The landscape approach has been developed mainly by the academic and NGO community to address sustainability issues related to human exploitation of or dependencies on the biophysical environment. It has characteristics of being developed in splendid isolation of the 'real world' where interests of dominant sectors, power play, shady political processes and unequal access to information and decision making are a common concern to those working on conservation, sustainable use and equitable sharing of biodiversity (= the CBD objectives).

The most widely used tool to address these issues in the real world is impact assessment. What started as environmental impact assessment (EIA) for large investment projects in the late 60-ies and 70-ies in the Western world, has now evolved into a suite of tools to assess environmental, social, economic, institutional and health effects for the entire planning hierarchy of policies, plans, programmes, and projects. Virtually all countries have legislation on EIA (or ESIA where environmental and social are integrated) for projects of certain size (EIA is a heavy procedure so it should only be used for major interventions; smaller activities can fall under a simpler licencing procedure). EIA can provide information for the choice of location, type of applied technology, and address impacts related to construction, operation and decommissioning works.

The realisation that projects often are the end result of sectoral and spatial planning processes led to the development of strategic environmental assessment (SEA) for policies, plans, and programmes. By introducing SEA earlier in the planning process, the scope to avoid negative and enhance positive consequences by alternative design becomes much bigger. For example, the choice for a transport corridor is not made at the project level but at the level of, for example, a national transport plan. SEA can support decision making on such plans by providing information on the consequences of alternative trajectories or modes of transport, or pro-actively define the sustainability boundaries within which the plan has to be developed. SEA is increasingly being adopted globally (all EU member states have a legal obligation to do SEA).

Impact assessment is designed to (i) provide scientifically sound information and (ii) involve stakeholders, in order to contribute to (iii) transparent decision making. Impact assessment is a process instrument designed to work in a not-ideal world; in many countries it is the only legal instrument that guarantees involvement of affected stakeholders and the sharing of information on important decision-making. It has no pre-defined content as each EIA or SEA is case-specific; the process needs to be filled with case-specific information. It neither has the power or intention to stop developments; decisions on a plan or project can go against the outcome of the EIA or SEA. The simple fact of having an in-built guarantee of accessible information, stakeholder involvement and transparent decision-making creates a level playing field for stakeholders and political debate.

SEA has many similarities with the Landscape Approach, but since it is embedded in day-to-day reality of political decision making it may provide important elements for the effective implementation of the landscape approach.

Conclusion: for a landscape approach to be effective it should ideally be linked to a formal planning process such as a regional development plan, a spatial plan, a sector plan (e.g. transport). SEA is designed to provide information on the

sustainability of such plans, involve stakeholders in the process and guarantee process transparency. These are shared principles with the landscape approach, so SEA can be an ideal implementation vehicle to introduce a landscape approach.

The ideal government planning cycle knows four levels (adapted from [OECD-DAC, 2006](#) SEA Guidelines):

- **National Sector policy** (NBSAP, energy, transport, etc.) – may lead to sector induced landscape approaches at lower plan or programme levels (for example by using SEA as a legally embedded process instrument).
- **Sector plan / spatial plan** – the ideal level to introduce a landscape approach, as a planning mechanism or in the accompanying SEA. The SEA has limited detail (usually qualitative or semi-quantitative assessment) but a large width in defining potential alternative options.
- **Implementation programme**: development of a series of coherent project proposals within the boundaries defined by the plan. SEA at this level becomes more detailed, but is more limited in its choice of alternatives.
- **Individual projects** – concrete implementation of measures (at this level EIA plays its statutory role).

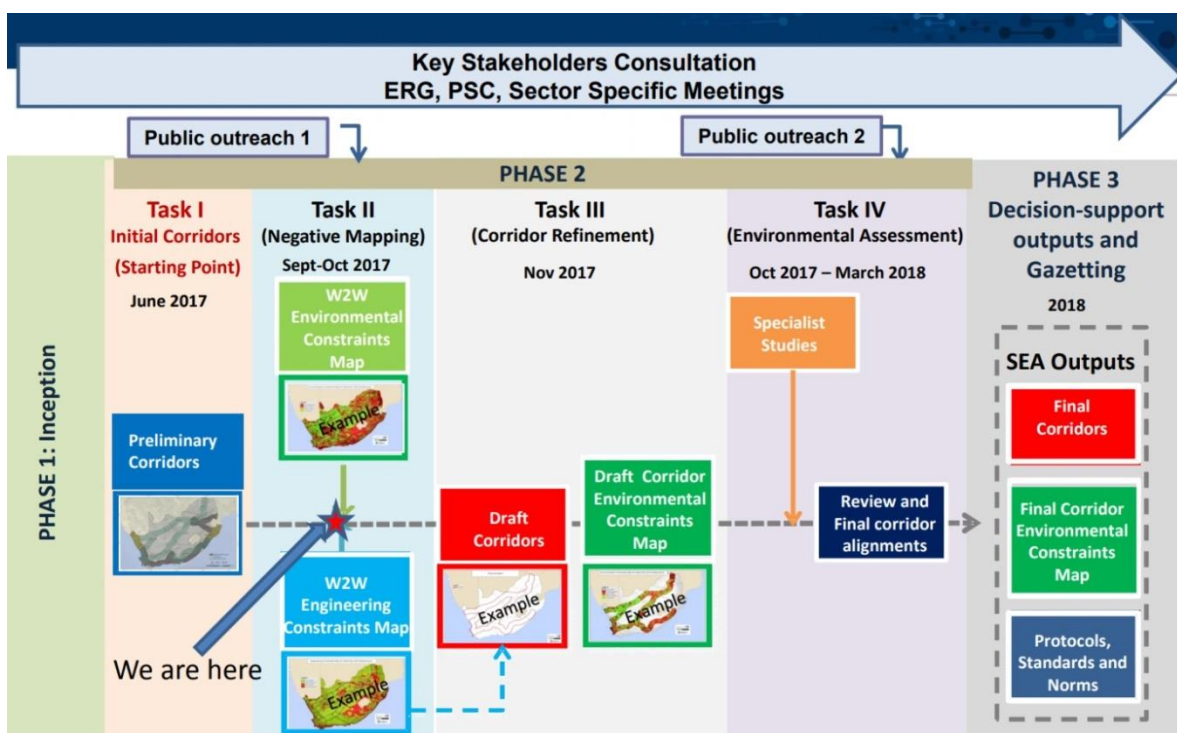
5. SOME CASE EXAMPLES⁴

5.1 SEA FOR DEVELOPING A GAS PIPELINE NETWORK FOR SOUTH AFRICA

Case to illustrate a conceptually easy and straightforward procedure to define the optimal routing for a gas pipeline network in South Africa, taking into account biodiversity (and other) interests.

Source: Final version SEA [published](#), March 2020

The development and related operation of infrastructure for the bulk transportation of gas require environmental authorisation and Environmental Impact Assessment. Strategic planning of a network of pipelines needs to be undertaken well in advance of the final planning of a gas transmission pipeline system. To ensure that environmental authorisations are not a cause for delay, a Strategic Environmental Assessment (SEA) was commissioned. The aim of the SEA is to identify and pre-assess environmental sensitivities within suitable gas routing corridors. The SEA process also provides a platform for coordination between the various authorities responsible for issuing authorisations, permits or consents, in view of streamlining the authorisation process further.



The process had 3 phases, with the second phase being the formal SEA divided into 5 tasks (see above illustration)

Phase 1: Positive mapping based on energy supply and demand resulting in preliminary corridors.

Phase 2: Assessment Phase with 5 tasks (= SEA)

- **Task I: Confirmation of initial corridors** - 100 km wide, linking supply and demand areas. Gather information from gas users, business and government stakeholders.
- **Task II: Negative mapping**, identifying key environmental sensitivities and engineering constraints in terms of gas pipeline infrastructure development. Environmental sensitivities were regarded as environmentally sensitive features that may be negatively impacted by gas pipeline development (e.g. wetlands, estuaries, all types of Protected Areas,

⁴ See also case studies promoted by members of the [CMS Energy Task Force](#):

- [Towards Bird-friendly Powerlines in Egypt.](#)
- [Strategic Environmental Assessment \(SEA\) for Wind Power and Biodiversity in Kenya.](#)
- [Mainstreaming best practice guidelines for assessing and monitoring impacts on birds at wind energy facilities in South Africa.](#)

etc.). Engineering constraints were considered as environmental features that are likely to impact upon the development of gas pipeline infrastructure (e.g. mining areas, steep slopes and forestry areas, etc.). Dedicated national scale, wall-to-wall environmental sensitivity and engineering constraints maps were developed, highlighting areas of sensitivity and constraints across four tiers (Very High = avoid, High = mitigate, Medium = mitigate and Low).

- **Task III: Corridor refinement.** This process entailed shifting the corridors slightly, where possible, to obtain as many areas of low sensitivity within the corridors. The national, wall-to-wall, environmental sensitivities and engineering constraints maps from Task 2 were then reduced to produce a draft environmental and engineering constraints map (= refined corridors).

- **Task IV: Environmental Assessment of the corridors.** The specialist team was appointed in December 2017 to assess the Draft Refined Corridors. Specialists were required to review, validate and enhance the draft environmental sensitivities map for a range of environmental aspects, including 8 terrestrial and 2 aquatic ecosystem criteria (see figure below). Species movement, migration, habitat fragmentation and connectivity are part of an extensive set of landscape features (over 150) used to define mapping sensitivity.

- **Task V: Gazetting process** – release of SEA for public comment

Phase 3: Decision-Making Framework: environmental management measures and planning interventions for inclusion in legal environmental framework and local government planning tools.

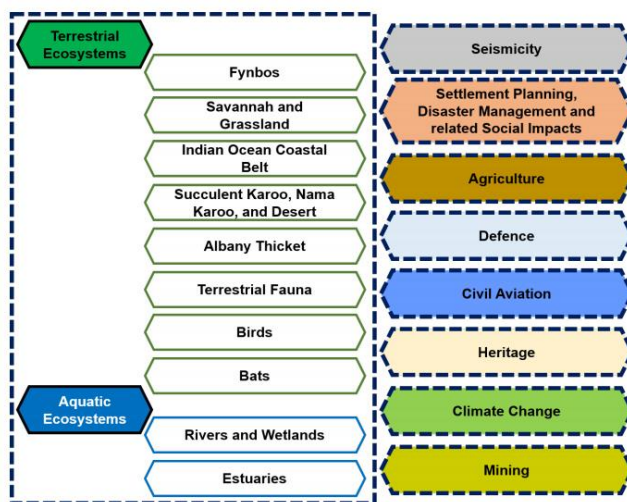


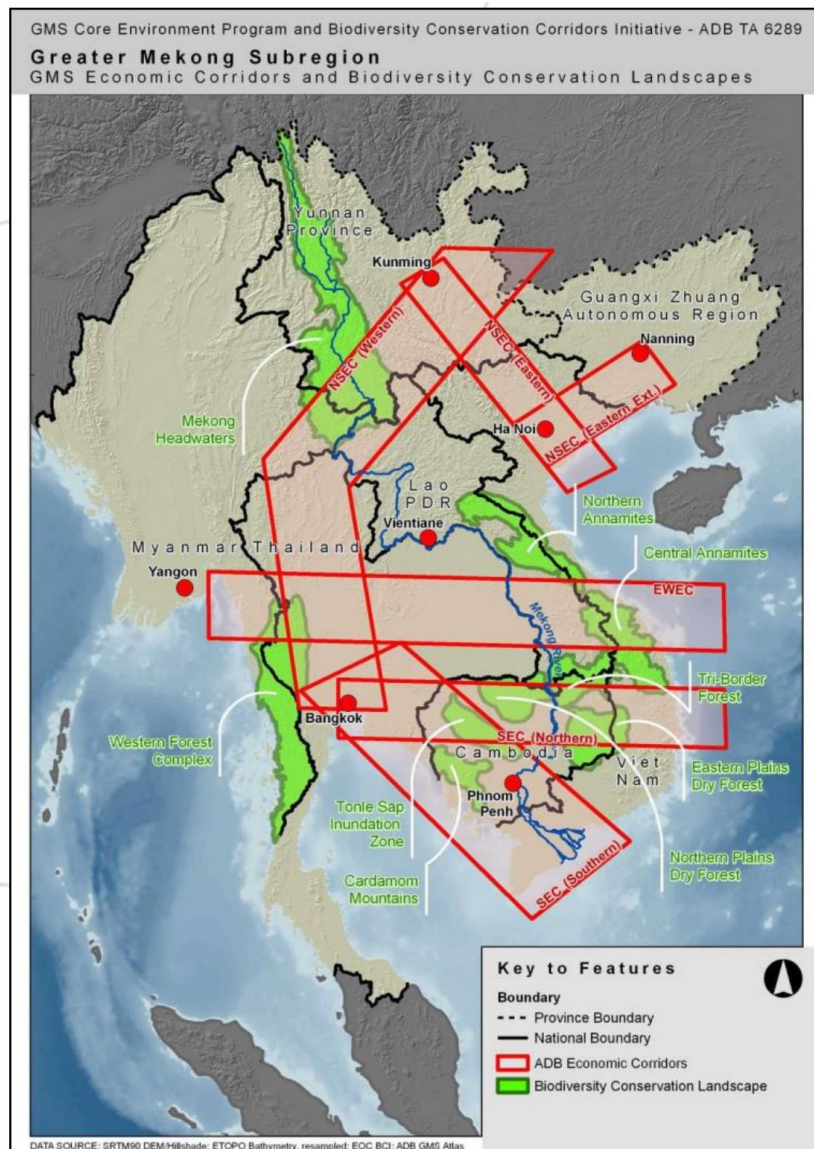
Figure B: Specialist Assessments and Additional Impact Chapters forming part of the Gas Pipeline SEA.

5.2 BIODIVERSITY CONSERVATION CORRIDORS IN THE GREATER MEKONG SUBREGION

Case to show the importance of good quality and formalised biodiversity information in SEA for corridor planning.

The Greater Mekong Subregion (GMS) is one of the fastest growing areas in the world. Under the GMS Economic Cooperation Program billions have been spent on infrastructure to provide physical connectivity in the region. Physical transport corridors are developed to serve as economic corridors.

The GMS is also one of the world’s richest biodiversity hotspots. The pressures associated with the region’s economic growth are causing habitat fragmentation and unprecedented loss of biodiversity, including key ecosystem services that sustain national economies (see box below on fisheries).



Without dedicated action, GMS may lose more than half of its remaining natural land and water habitats over the next century. The [GMS Core Environment Program](#) (CEP) and the [Biodiversity Conservation Corridors Initiative](#) (BCI) were launched to, among other goals, (i) promote the use of SEA for economic corridors and sector strategies, and (ii) to establish sustainable management and use regimes in biodiversity conservation corridors.

BCI consists of a network of connected protected and sustainable use areas to conserve the region’s critical ecosystems. **Biodiversity corridors are a strategy for combating habitat fragmentation and conserving threatened species and**

high-value ecological processes that require large spatial areas for their viability over the long-term. This resulted in a map with clearly demarcated areas of prime conservation interest.

By simply superimposing an economic corridor development plan over the biodiversity corridor map, areas of potential conflict are highlighted and the need to think about alternatives to avoid the two corridors crossing or to define mitigation measures, immediately becomes obvious. For various proposed corridors SEA provided the procedural context to facilitate this process. In the pilot SEA for the North-South Economic Corridor a start was made to also add ecosystem services to the BCI map.

The very existence of the Biodiversity Corridor map has had a significant impact:

- (i) all planning studies took the map into account;
- (ii) the international donor community puts heavier requirements on projects located in the biodiversity corridor;
- (iii) additional safeguards are being requested for proposed projects; and
- (iv) national leaders of the participating countries have signed for the BCI.

Reconciling (migratory) fish and hydropower dams in the Mekong river – an open ended story

The Mekong river (Lancang Jiang in China) is the back-bone of regional development plans. It is 4,350 km long, originating on the Tibetan Plateau and runs for over half its length through China before either running through or along the borders of Myanmar, Thailand, Lao PDR, Cambodia and Vietnam where it enters the South China Sea via the Mekong delta. The river's productivity is dependent upon seasonal variations in flow rates creating a dynamic system of annual flooding and drought conditions to which both wildlife and man have adapted. It is estimated that the Mekong river provides habitat for more than 850 fish species. Many of these are endemic and about 135 species are migratory (more than any other river). The Mekong supports the world's most productive inland freshwater fishery (accounting for 25% of global freshwater catch) comprising 2.6 million tons of freshwater fish annually. (Among the endangered species of the region are the iconic Mekong/ Irrawaddy River Dolphin - *Orcaella brevirostris*.)

The Mekong is one of the world's most active regions for hydropower development. To date eleven (cascade) dams have been built upriver in Yunnan and at least another eleven are either proposed, under construction or operational downriver on the mainstream Mekong. Hydropower dams are being built on the main channel of the Mekong (which arguably have most negative impacts on fish migration) and hundreds of others are also being built on the Mekong's tributaries.

The inter-governmental [Mekong River Commission](#) (MRC), established in 1995, has commissioned an SEA ([MRC/ICEM, 2010](#)) to assess the 12 proposed mainstream hydropower dams in the middle/lower Mekong to provide a broader understanding of the opportunities and risks of such developments. It was intended to highlight broad strategic concerns which need to be considered prior to making project specific decisions. The study highlighted knowledge gaps and key risks of proposed mainstream developments. The SEA recommended to postpone decisions on mainstream dams for a period of ten years to allow for comprehensive feasibility studies for partial in-channel, diversion and other innovative systems for tapping the power of the Mekong in ways which do not require dams across the full extent of the river channel. Emphasis was also put on tributary projects considered feasible and ecologically sustainable.

It is not clear how the SEA process influenced decision makers, but some MRC member countries decided to have a 10 year moratorium on new dam developments in the Mekong. In the meanwhile MRC published further studies in its so-called [Council Study \(2017\)](#) to close important knowledge gaps. It includes a Cumulative Impact Assessment. Pressure is building to proceed with a number of highly contested mainstream dams.

Source: Hobbs & Sloomweg (in prep). The Mekong River Corridor; A Critical Test for EIA/SEA Effectiveness.

5.3 ASSESSMENT OF PROPOSED DAMS IN THE MARA RIVER BASIN

Case to show how infrastructure projects can have distant, but serious impact on wildlife migration in a transboundary river basin; both SEA and EIA play an ill-defined but influential role in providing essential information.

The Mara River Basin is a transboundary basin; it covers an area of about 13,835 Km², 65% in upstream Kenya and 35% in downstream Tanzania. The Mara River originates in the Mau escarpment in Kenya from two smaller rivers: the Amala River and the Nyangores River. The Basin is internationally renowned for the Serengeti savannah landscape, including the Kenyan Mara National Reserve and Tanzania's Serengeti National Park, famous for the spectacular [annual migration of some 2 million large herbivores that depend entirely on the water from the Mara River](#) during the dry season. The river ends in Lake Victoria.

The Mara River is characterised by relatively short peak flows and prolonged low flow conditions. Except for occasional dry spells, the river is permanently flowing. Human water abstraction from the Mara River is low when looking at the average annual amount of water available. Ecosystem services that regulate the water balance of the river basin are degrading due to human pressure, unsustainable land use practices and climate change. The upland water storage service of the Mau forest has significantly reduced. The combined result of the above processes is a river with higher peak flows and reduced low flows. Low flow conditions in the dry season are the bottleneck of the Mara river basin; given the changing conditions the risk of the Mara running dry for prolonged periods is real; consequences will be detrimental for human communities and catastrophic for the Mara/Serengeti wildlife.

Improved water storage in the basin with dry season release is a solution. Storage can be improved by making use of natural ecosystem services through improved land use practices, forest restoration and water conservation measures. Enhanced groundwater infiltration will create a prolonged downstream water release and increase the low flow; it would simultaneously reduce the erosion and sedimentation problems.

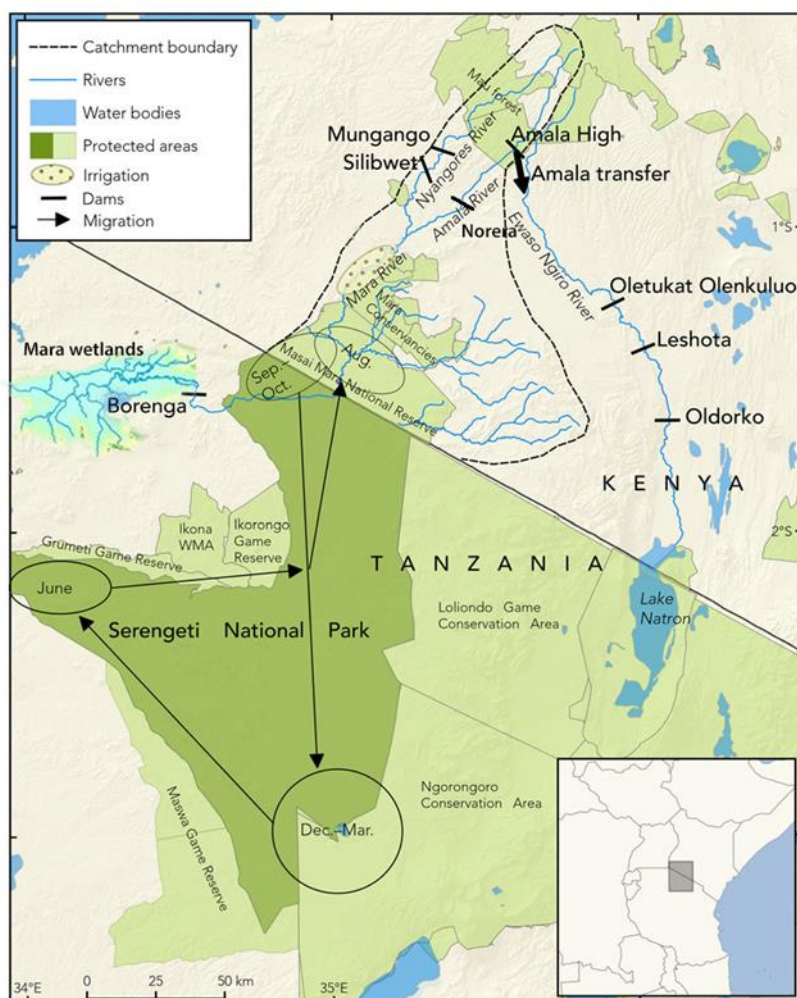


Figure: The Mara and Ewaso Ng'iro River Basins, including Mara wetlands and Lake Natron, approximate locations of 8 proposed dams, protected areas and wildebeest migration cycle (source: Sloomweg 2020, adapted from Mnaya et al., 2017)

However, storage can also be created artificially by upstream storage dams. Plans for several upstream dams exist, with the purpose of storing water for irrigation and hydropower, with the opportunity to guarantee an environmental flow for Serengeti (depending on water management and allocation). One plan foresees in the diversion of water from the Mara into the Ewaso Ng'iro basin for hydropower. Managed storage dams create the problem of water allocation priorities in extremely dry years. Will the downstream users/uses get water at the cost of upstream users/uses? Will ecological reserve flows be maintained for wildlife in the Serengeti when upstream irrigation schemes run dry?

In 2012 a [Trans-boundary Strategic Environmental Assessment](#) (SEA) report was produced by the Lake Victoria Basin Commission, including a first [environmental flow requirement calculation](#). It provides baseline information, an overview of issues and a possible way forward. One of the main issues was the lack of coordination between the two basin countries and between the large number of interest groups working in different areas. At that moment there was no mechanism for coordination and management. Yet, several preliminary EIAs (linked to feasibility studies) for individual dams highlighted the need to maintain conservation flows in the Mara River and the need to coordinate the operation of different dam and irrigation plans.

In response to the increasing sense of urgency to address issues at basin level, in 2015 a [Mara River Basin MOU](#) between Kenya and Tanzania has been signed providing the regulatory umbrella for concerted action by both countries. The Lake Victoria Basin Secretariat has the regional mandate to coordinate and implement such action. The MOU is supported by detailed water allocation plans in Kenya and Tanzania. The role of EIA studies and the need to share the results of such studies is emphasised.

Concluding, one can observe that SEA and EIAs have provided relevant information and contributed to increased awareness on the need for planning and decision making at basin level, taking into account human development needs and the need to sustain the globally unique migration of over a million large herbivores in the Serengeti savannah ecosystem.

5.4 LAMU PORT-SOUTH SUDAN- ETHIOPIA (LAPSSSET) INFRASTRUCTURE CORRIDOR

Case with SEA at the highest strategic planning level for an international corridor with potentially serious direct and indirect consequences for migratory terrestrial animals

Source: [SEA for the East-African LAPSSSET Corridor](#)

The LAPSSSET Corridor Development Authority (LCDA) is developing the Lamu Port-South Sudan- Ethiopia (LAPSSSET) Infrastructure Corridor, an integrated transport infrastructure corridor. It spans over 2000 km and brings together Kenya, Ethiopia and South Sudan. The program consists of seven key infrastructure projects, including port development, interregional highways, crude and product oil pipelines, railway lines, 3 international airports, 3 resort cities, and a multipurpose dam along the Tana River.

The 2017 SEA process involved 47 meetings with a total of 1871 stakeholders that had the opportunity to discuss the proposed plans and raise issues. The SEA is a good example highest strategic level impact assessment, superimposing an ambitious and large corridor plan on a region with serious environmental and social problems.

Six questions were framed to focus the SEA Study:

- What are the defining features of the Northern Counties targeted to be transformed through LAPSSSET;
- How well is LAPSSSET attuned to drive the economic transformation;
- What is the prevailing legal regulatory, policy, institutional and strategy framework;
- What opportunities are available for LAPSSSET;
- What are the social and environmental costs attendant to achievement of LAPSSSET goals;
- What measures need to be put in place to secure gains anticipated under LAPSSSET.

The impact analysis addressed three different perspectives:

- the compatibility/relevance of the plan to government planning goals at national, regional and county levels;
- international standards for sustainable development, and
- stated stakeholder concerns and interests.

In the assessment the SEA identified a number of major concerns for the corridor:

LAND. Increasing structural poverty due to drought, declining land productivity, accelerated erosion. In a subsistence economy that relies on ecosystem goods and services, land becomes a critical resource whose access and control is central to livelihood security and is often defended aggressively. The impact of LAPSSSET can be positive or negative and highly depends on how the programme is implemented.

WATER. On account of projected population growth, the national water availability situation will by 2030 drop to absolute scarcity. Water demand will largely outstrip supply by 2030. Imposition of LAPSSSET interventions on such strained water budgets will aggravate an already stressed scenario.

WILDLIFE. LAPSSSET is being developed against the backdrop of massive decline in the national wildlife resource base, referred to as Kenya's silent disaster. Yet, Northern Kenya has the highest number of wildlife that are found outside protected parks compared to anywhere else in the country and wildlife provides the main selling point for tourism, Kenya's number one foreign income earner. The Corridor interferes with 13 protected areas, many community-owned and private ranches or conservancies, 12 important bird areas, 10 National Parks or Reserves and several migration

routes of large mammals. Although the transport corridor itself will pose direct and long-term consequences to wildlife, it is the anticipated realignment in land-use that will probably pose the greatest threat.

POTENTIAL CONFLICT. The most drastic longterm impact of LAPSSET is land use transformation along the Corridor and beyond. A scenario whereby jobs and opportunities associated with LAPSSET appear to benefit newcomers at the expense of locals can be a potential source of conflict. Armed conflict between groups of mobile pastoralists driven from their dry season grazing area and other groups already is a fact of life in the region; sabotage of the corridor is considered a possibility.

A large number of measures is defined to counteract the observed problems, in terms of (i) policy adjustments, (ii) legislative action, and (iii) strategic action plans, all within a set time frame. The SEA further calls for follow up actions, such as full ESIA studies for all LAPSSET projects, Resettlement Action Plans for displaced people prepared in full consultation with stakeholders, and where doubts on the impact prevail, particularly with regard to water and wildlife, the pre-cautionary approach should be adopted.

6. WORKPLAN FOR THE WORKING GROUP ON LINEAR INFRASTRUCTURE

6.1. DEFINING THE WORK AGENDA

CMS COP [Decision 13.131](#) calls for the establishment of a multi-stakeholder Working Group on linear infrastructure composed of stakeholders with experience and knowledge on the impact of linear infrastructure development on migratory species and options for mitigation. This chapter will provide suggestions on the tasks and composition of the working group.

Legal and procedural instruments to take migratory species into consideration in the preparation and funding of policies, plans, programmes and projects linked to infrastructure are in place. EIA and increasingly also SEA are seen as effective instruments to address potential environmental impacts prior to decision making. International financial institutions apply these instruments to implement their environmental safeguards policies. Even though content-wise the attention to migratory species in safeguards is rather minimal, the necessary ‘hooks’ to flag issues related to migratory species are there. If proponents of infrastructure plans and projects are willing to do good impact assessment, migratory species issues can be addressed. Raising the awareness on potential migratory species issues with new infrastructure and provision of relevant expertise may help in putting migratory species on the agenda. The need for good screening and scoping guidance has already been discussed.

Relevant knowledge is available but dispersed. From the overview in this report it becomes clear that the availability of knowledge is not the issue. (See for example the excellent work by CMS and partners in the [Central Asian Mammals Initiative](#)). The problem moreover is that infrastructure planners and decision makers are often little aware of the issue and the need to include this in their decision-making processes. They may neither know where to find relevant information. The various guidance documents cited in chapter 4 show that migratory species are not addressed in any consistent manner, if the issue is addressed at all. Apart from very few exceptions, even guidance documents that do pay attention to migratory species usually only highlight the issues in a generalised manner; they do not go into any detail on different functional species groups, research methodologies, sources of information. In other words, the available detailed scientific information needs to be mainstreamed for general use.



Figure 6.1: A summary slide from the IAIA (2015) symposium on Sustainable Mega-Infrastructure and Impact Assessment provides a simplified overview of where we stand and where we need to go.

From mitigation to avoidance to improvement. Where most guidance documents related to wildlife and infrastructure focus on mitigating the impacts of linear infrastructure, the real question of course is how to entirely avoid negative impacts by alternative routing or design of infrastructure. And more ambitiously, how to contribute to a better and healthier planet by enhancing the situation of migratory species. Infrastructure development involves sizeable investments which provides opportunities for action, if only the relevant issues are on the agenda from the onset. One

of the main messages constantly being publicised is the need for more strategic thinking. For a real transition to a sustainable world the level of ambition has to be raised from *doing no harm* to *doing good*.

Mainstreaming by upstreaming. From the infrastructure community, the biodiversity community and the impact assessment community there are consistent calls for more strategic planning to be able to address the challenges posed by the Sustainable Development Goals (see also Figure 6.1). At higher planning levels there is more room for integrated planning at landscape level. SEA can play a role in defining the boundaries of sustainability of such policy planning processes, and it can accommodate a landscape approach to guarantee an inclusive and transparent process. The issue of migratory species has to be part of the assessment process. Where EIA continues to play its role in avoiding negative impacts (*do no harm*) of proposed projects, SEA can be used to start thinking in terms of enhancement (*do good*) and thus contribute to a transition towards sustainability.

For CMS and the Working Group it is important to think about the consequences of the above approach since its focus of attention has to go beyond the migratory species agenda. Plans for economic corridors (like China's belt & road and many others) and policies that may lead to major infrastructure works (e.g. energy, transport, water policies) have to be identified as early as possible in order to be "on board". Parties play a major role in this, while CMS can provide guidance and facilitate discussion. The Working Group can take the Energy Task Force as an example, but will have to move further. Instead of acting supply driven (providing migratory species information) it is important to start thinking in terms of the architecture of policy, planning and decision-making processes related to sectors in which (linear) infrastructure plays a dominant role, the information needs of various steps in these processes and what kind of information is most effective at each step in the process.

Migratory species are a small part of the biodiversity theme; biodiversity itself is a small part of all issues that may be studied in impact assessment of infrastructure plans and projects. Impact assessment is only one of the many documents that inform decision making during a planning cycle or project design and feasibility study. It would make sense to integrate all available expertise on all groups of migratory species into one initiative.

Some issues remain under the radar. Freshwater fish migration is a big issue in river development projects but the convention has few listed freshwater species. For example [Res.11.27 \(Rev. COP13\)](#) on Renewable Energy only one provision on aquatic species for hydropower dams. There is obviously much more to say on this. Non-protected or non-threatened species may represent important ecosystem services but are not on the radar of the convention.

6.2 TASKS OF THE WORKING GROUP

- **Reach out** to the infrastructure community, learn their language and procedures by:
 - Inviting sector representatives into the working group.
 - Join relevant platforms, conferences, workshops and introduce the migratory species issue.
 - Join green infrastructure / nature-based solutions initiatives to secure opportunities to promote the cause of migratory species.
- **Provide information** on migratory species by:
 - Compiling a list of existing CMS publications and other resources on a dedicated website.
 - Creating an information point/service for Parties, financial institutions, project developers, etc.
 - Creating an overview of international migratory species expertise to which the convention secretariat has access, differentiated by region, species group, and infrastructure experience.
 - Collect and share good (and worst) practice cases and draw lessons.
- **Develop guiding materials** to facilitate integration of migratory species interests into existing procedures:
 - Develop global impact assessment screening guidelines, translating threats and pressures affecting migratory species into unequivocal screening criteria for EIA at country level.
 - Develop global impact assessment scoping guidelines for migratory species. Use the functional groups approach to distinguish between physically different migration mechanisms (see India Guidelines). Differentiate between scoping for policy, plan, programme and project level. Describe information needs at various levels of planning and decision-making, probably differentiated for sectors and for

- spatial/regional planning. Also think about opportunities for EIAs and SEAs to identify positive impacts to enhance the protection of migratory species and their needs, thus contributing to a real green transition.
- Develop communication materials targeted at infrastructure-related sectors and impact assessment communities and distribute through the above outreach work.
 - Assess the representation of migratory species in global biodiversity data portals (e.g. GBIF, IBAT, ..), and provide recommendations if needed. Translate recommendations for Parties that want to develop their national data portals.
- **Seek synergies and work with Parties by:**
 - Seek synergies with existing CMS initiatives relevant to infrastructure, particularly the [CMS Energy Task Force](#)
 - Making an inventory of the present status of impact assessment application for infrastructure development and how migratory species are being addressed.
 - Identify information and capacity needs with Parties.
 - Make an inventory of best (and possibly also worst) practices in impact assessment for infrastructure policies, plans, programmes and projects in relation to migratory species. Distil lessons for different levels of decision making and different categories of plans (e.g. sector policies versus spatial development plans).
 - Share lessons among parties through the above-mentioned information point
 - (for further detail see questionnaire from chapter 3)

6.3 COMPOSITION OF THE WORKING GROUP

Potential members of the working group can be found in the following categories:

- **Infrastructure** sector: the most advanced thinking on sustainability in infrastructure development is the G20 Quality Infrastructure initiative, supported by OECD. Other global platforms are UNEP’s Sustainable Infrastructure Partnership and the Global Infrastructure Hub. Infrastructure is the expression of many sector interventions so members can also be found in sectors such as transport (International Transport Forum), dams (International Hydropower Association), mining (ICMM), etc.
- **Impact assessment:** the IAIA is the world leading platform on impact assessment, representing a mixture of experts working in government, private sector, scientific community, NGO’s and financial institutions. IAIA does have a biodiversity section, but it may be wiser to stay out of the green silo and invite someone with SEA for infrastructure planning expertise.
- **International Financial Institutions:** IFC is the most prominent private sector funding body where it concerns biodiversity safeguards. The World Bank and the regional development banks (AfDB, AsDB, IADB) are the “usual suspects” to ask for. It would, however, be interesting to ask the European Investment Bank as they are deeply involved in the implementation of the European Green Deal, globally the most ambitious transition plan; on the other hand the Asian Infrastructure Investment Bank (“the China Bank”) may provide relevant views on the world’s largest infrastructure investment plan, the belt & road initiative. In 2015 the Multilateral Financing Institutions Biodiversity Working Group (twelve banks and donors including IFC, IADB, EIB, WB) published two documents; the present status of this working group is unknown.
- **Migratory species:** representative(s) of the scientific community involved in research of terrestrial migratory species, preferably also experienced in assessment of large infrastructure projects.
- **Global biodiversity data portals:** GBIF, IBAT, EU, ...
- **National governments:** one or more interested Parties with migratory species and infrastructure issues; these may also be interested in piloting some of the outputs of the working group. It would be ideal to not only have the CMS focal point but also a representative of the line ministry responsible for the planning of major linear infrastructure works (e.g. transport or energy department).
- **NGO’s:** WWF-US has been rather intensively involved in infrastructure; IUCN for Red Lists and key biodiversity areas
- **International platforms:** CBD to provide the link with the general biodiversity agenda; IPBES to provide a link with the ecosystem services theme; transportation and infrastructure related conventions.

ANNEX 1: ANALYSIS OF NATIONAL REPORTS (2019) TO CMS

High-level summary of key messages

Australia: Single Species Action Plans focus attention and prioritise activities to facilitate the conservation of migratory species. The ability to include non-Party range states in subsidiary agreements and MoUs is a significant successful aspect of the Convention. Given the legally-binding obligations for Parties that result from the addition of species to Appendix I, there has been an inconsistent application and/or understanding of the definition of migratory under the Convention.

Costa Rica asks for major assistance by CMS to the Americas region to strengthen their implementation capacity for provisions of the convention. Morocco in a more general manner calls for international expert support in the protection of migratory species.

Ghana considers the existence of Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) tools as a success.

- *V. Awareness*

Australia: reports on the publication of an information paper on Acoustic Impact Evaluation and Management, related to CMS (2017) Guidelines on EIA for Marine Noise-generating Activities. An NGO has raised awareness and general capacity about the CMS Noise EIA Guidelines with fisheries associations and the conservation community.

Costa Rica reports on guidelines to avoid forest fauna electrocution by powerlines.

Norway considers the outreach to decision makers to change practices as one of the difficulties in implementing the convention.

- *VI. Mainstreaming migratory species in other sectors and processes.*

Australia report on the Environment Protection and Biodiversity Conservation Act 1999 , including industry guidelines for avoiding, assessing and mitigating impacts on listed migratory shorebird species, and regulations for offshore petroleum and greenhouse gas storage facilities requiring evaluations of all environmental impacts and risks of activities and demonstration that these impacts and risks are of an acceptable level and reduced to as low as reasonably practicable; consideration be given to the presence of listed migratory species under Australia's EPBC Act.

Belgium refers to the protection of species, including migratory species, and their living habitats by means of environmental impact assessments of planning processes for development projects, such as infrastructure, industrial development, wind mills,....

Bolivia pleas for the integration of migratory species in (instruments for) planning and poverty reduction strategies, with special emphasis on energy, natural gas and mining sectors.

Brazil: Movement of aquatic migratory species such as the Amazonian turtle (*Podocnemis expansa*) are part of licensing requirements of major infrastructure works such as the construction of dams and hydroelectric plants in the Amazon, mining activities and road construction.

The Brazilian NBSAP refers to the assessment of the impact of international trade on endangered species.

Croatia highlights the difficulty to mainstreaming of conservation measures for migratory species in other sectors, particularly agriculture and fisheries, due to insufficient institutional capacities, advice and training, and no buy-in from stakeholders and the local community.

Georgia states that there is not a single legislative document dedicated to the migratory species, although the species included in the CMS Appendices are protected by Emerald Sites and by permits issued on the basis of submitted EIAs for construction and other development activities, etc.

Ghana and Kenya position EIA as a means for the private sector to mainstream migratory species in project development.

India refers to the difficulty to coordinate with the other Ministries and Departments.

Kenya considers the management of impacts resulting from development projects undertaken in wildlife distribution areas as one of their main difficulties.

Morocco considers environmental protection as a priority in the development of sector development strategies. On the one hand migratory species are indirectly protected by habitat protection, on the other hand by application of impact assessment. Yet, environment is hardly taken into account in poverty reduction strategies.

The Netherlands report on the Wind Energy at Sea Ecological Programme (WOZEP), developed to minimize the effects of (the construction of) wind turbines on migratory species, such as birds, marine mammals and bats. Early warning system for wind turbines protects migratory birds and bats.

Paraguay refers to the law on Fisheries and Aquaculture stating that any work that may alter the hydrological or hydrobiological regime must have an EIA, which includes appropriate measures to mitigate environmental impacts; in particular, measures for the conservation of vital ecosystem, especially spawning grounds.

Saudi Arabia make a plea for the integration of the conservation and sustainable use of migratory species in strategies and action plans of other relevant sectors.

Slovenia refers to the need for EIA procedures to assess negative impact of wind turbines at plan and project level to minimise impacts; permits may be refused if not addressing the issue in a satisfactory manner.

In Uganda all development projects are subject to an environmental and social impact assessment where all the likely impacts are identified and mitigation measures prescribed.

UK indicates that developments are subject to effective planning control that has Environmental Impact Assessment at its heart. Developments that may have an impact on migratory species are fully assessed before implementation. A number workshops was organised on mainstreaming of biodiversity in EIA on the isle of Montserrat, where major development was needed to replace the natural capital on this small island which was destroyed in 1997 by volcanic action.

Ukraine has adopted laws on EIA (2017) and SEA (2018) (including guidelines) that allow to take into consideration the needs and peculiarities of migratory species.

- *VII. Governance, policy and legislative coherence.*

Austria considers the implementation of CMS targets in EIAs as a priority for future work.

Bolivia reports on the need for institutional and technical capacity development, particularly at lower levels of government, including the decentralisation of responsibilities

UK reports that a Common Environmental Assessment Framework (CEAF) has been established to facilitate cumulative assessments of impact of large-scale deployment of offshore wind power across Europe. The work will be beneficial for a range of migratory species. Furthermore, an offshore Energy SEA programme has supported research projects, assessing potential impacts of offshore renewables and populations of marine mobile species. The Crown Estate manage the seabed around England and Wales and is funding a programme of strategic projects to enable accurate assessments of plan-level impacts for future round of seabed leasing for offshore wind

- *X. Threats and pressures.*

Brazil reports on Impact Reduction Plans by ICMBio, a tool for decision support and environmental management, whose main objective is to create scenarios of compatibility between biodiversity conservation and the development of socioeconomic activities. Further reference is made to wind farms along migratory flyways, and plans to reduce the

impacts of Amazonian hydroelectric plants and the exploitation of oil and gas to marine and coastal biodiversity. Unclear how these initiatives relate to Brazil's EIA legislation.

India has developed guidelines on "Eco-friendly Measures to Mitigate Impacts of Linear Infrastructures on Wildlife" (Wildlife Institute of India, Dehradun).

Kazakhstan refers to pressure from an increasing number of infrastructure facilities. Legislative regulation is under way to ensure that the specialized crossing corridors for wildlife are developed while developing infrastructure projects.

Specific provision in Resolution 7.2 (Rev. COP12) on impact assessments

Croatia refers to their Ecological Network Impact Assessment (ENIA), implemented through SEA for strategies, plans and programs. For project it can be implemented through EIA or stand alone. In such a manner, already in the early planning stages, favourable solutions are chosen in order to avoid or mitigate possible negative impacts on the environment and nature. In the reporting period several SEAs for infrastructure developments were conducted. These SEAs included the EU procedure of 'appropriate assessment' in light of their effects on conservation objectives and integrity of Natura 2000 sites (ENIA). A manual and several white papers covering specific type of projects have been elaborated, providing an overview of specific types of adverse influences and possible mitigation solutions for particular type of projects: road infrastructure, small hydropower plants and river management.

Ethiopia states that ESIA is mandatory prior to any development activity.

Ghana: all developmental activities likely to impact adversely on the environment, including migratory species, must be subjected to EIA. Within the reporting period, three prospecting wind energy generation companies established along the coast were subjected to EIA to minimise their impact on migratory birds. The Tana port expansion required relocation and creation of alternative breeding sites for marine turtles in conformity with EIA and Social Responsibility Agreement.

India refers to the monitoring requirements of projects with respect to conditions stipulated in the environmental clearance issued under EIA Notification, 2006 and Coastal Regulation Zone (CRZ), 2011/Coastal Regulation Zone (CRZ), carried out through the ten regional offices.

New Zealand's Resource Management Act 1991 regulates activities in both the terrestrial and marine environment (territorial sea). Local authorities prepare management plans to give effect to the Act requiring resource consents for activities with the potential for adverse effects. Applications for Resource consents must provide an assessment of environmental effects. Matters an impact assessment must address include the effects of the activity on the biological diversity and integrity of species, ecosystems, and processes, and, the effects of the activity on rare and vulnerable ecosystems and habitats of threatened species.

UK report on their EIA (1999) and SEA (2004) regulations. With other policies, these help to maintain and where possible to enhance the habitats of a wide range of migratory species. The Environmental Assessment of Plans and Programmes Regulations 2004 are implemented to ensure that certain (mainly public sector) plans and programmes are subject to SEA. This aims to provide a high level of protection for the environment and contribute to the integration of environmental considerations (including effects on migratory species as a component of UK biodiversity) into the preparation of plans and programmes, thereby promoting sustainable development. Although there are no specific references for any proposed new development to take account of migratory species, legislation implementing the EIA Directive in the UK has a requirement for developments of a certain type to consider transboundary effects. The EIA Regulations establish a consent system whereby a project is not granted consent to proceed if it is likely to have significant negative effects on the environment. Among the environmental factors considered is biological diversity, including migratory species.

The UK is involved in the North Sea wide initiative, through international cooperation (arising from the Political Declaration on Energy Cooperation between North Seas countries (June 2016)) to develop a common environmental assessment framework CEAF, for the effects of offshore wind farms on birds and mammals.

- *XI: Conservation status.*

Nothing relevant to the topic of this report

- *XII: Cooperating to conserve migration systems.*

Costa Rica reports on the lack of synergy for strengthened regional action in the Americas.

Ghana also refers to weak cooperation between neighbouring countries on implementation of the convention.

Kenya reports on limited intergovernmental cooperation and collaboration due to varying policies and approaches in management of cross border populations of migratory species such as African elephants.

In contrast, Norway considers CMS a success as it provides a platform for cooperation with other international organizations.

Rwanda refers to a Biodiversity Clearing House Committee to build synergies between the CMS and other Conventions; Rwanda Environment Management Authority (REMA) convenes quarterly meeting with National Focal Points for building synergies and develop coordinated approaches towards conventions implementation.

Spain urges for more international cooperation and increased private sector involvement.

- *XIII: Area-based conservation measures.*

Australia: NSW Government developed a Marine Estate Management Strategy 2018-2028 which supports a range of projects to better understand and mitigate threats to marine species. The coastal management framework incorporates migratory species, their breeding and foraging coastal habitats and migratory processes. One of the main management objectives of the NSW Coastal Management Act 2016 is to improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for migration.

Bolivia reports on a community based, landscape focussed national programme for the conservation and sustainable use of vicuñas, including capacity development and increasing added value of vicuña derived products (wool) to sustain local economies.

Brazil reports on the Amazon Sustainable Landscapes Project, aimed at improving integrated landscape management and conservation of terrestrial and freshwater ecosystems to promote PA management and connectivity in Amazon Region.

Ghana is currently using the Community Resource Management Areas concept to expand the critical habitats for migratory species on agricultural landscapes.

New Zealand refers to 5 landscape projects and landscape scale predator eradication to deliver the New Zealand government's ambitious goal of eradicating possums, stoats and rats by 2050.

In Pakistan, GEF and UNDP support a landscape based conservation project, the Pakistan Snow Leopard and Ecosystem Protection Program (PSLEP) .

Rwanda reports on success in transboundary collaboration in Greater Virunga Massif which resulted in building synergies while involving the community to protect migratory species.

In the UK protected areas, including those designated for migratory species, are embedded in the planning system in the UK which requires assessment of developments, consequently giving them (and the species they host) a high level of protection.

- *XVIII: Knowledge, data and capacity building.*

Australia reports on their 5 yearly state of the environment reporting, aimed at providing all Australians with authoritative information on the state of the environment, and providing the public, government and other decision-makers responsible for environmental management with an assessment of their effectiveness and what the key national environmental issues are.

Realising the importance of environmental information, the Government of India, in December, 1982, established an Environmental Information System (ENVIS).

The Netherlands provide examples of strong initiatives on data collection (citizen science) and sharing of information by governmental and non-governmental organisations.