

Comment form for 2nd Review Phase of IPBES Deliverable 3c) Fast-track methodological assessment on scenarios and models Chapter 8 ‘Improvements’

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German government
Diego Pacheco
Jens Mutke
Thomas Brooks
Marie Stenseke
David Cooper
U.S. Government

Brenda McAfee
Ian Perry
Michael Bordt
UK government
Yann Clough
Marina Rosales Benites de Franco
Ludunge Elias Abdullah

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
1	8	General				As for the other chapters that I have reviewed, I would like to congratulate the authors on their efforts and for producing such a thought-provoking piece. There seems to be a bias to biodiversity and I wonder if ecosystem services more could be considered in more depth?	Andrew Wade, UK government	Thank you for the positive feedback. We added examples and references to various subsections to strengthen the ecosystem services considerations, including Box 8.4. See also comment # 95 and 98.
2	8	General				The main text of this chapter is both useful and interesting. However, it seems the chapter most likely to overlap with the others, and this is most apparent in the recommendations and, particularly, the findings. Could the authors review the findings & recommendations of other chapters, in particular of chapters 2,3,4 and 6, and ensure that their own finding & recommendations are sufficiently distinguished, and, if not, reworded or deleted. As previously stated, there is good material in the main text, so perhaps it is a case of just emphasising the	Derek Tittensor	Key messages of the second order draft from all chapters were reviewed by the assessment chairs and others, and feedback was provided to us and the other chapters. We revised the key messages according to this feedback.

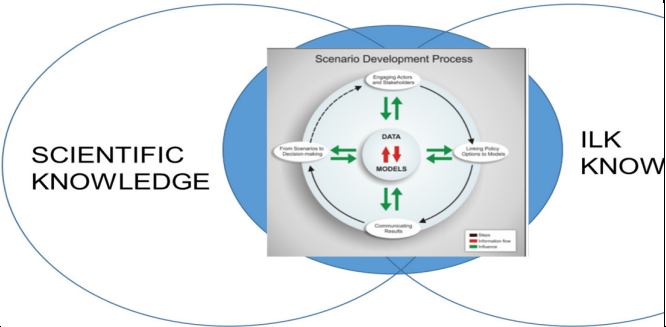
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						differences to other chapters.		
3	8	General				Overall: Good closing chapter. Some repetition throughout in terms of the same references / links appearing several time over (though difficult to avoid).	Shane Orchard	All authors reviewed the chapter to identify and remove internal repetitions.
4	8	General				<p>Chapters: 2; 3; 4; 5; 6; 8: The issue of dealing with uncertainty in models and scenarios (identifying, managing, communicating) is considered in almost every chapter in an explicit and broader part (see 2.3.4, 2.4.3, 3.5, 4.6, 5.5, 6.5, 8.2.3) This causes overlaps in content. Moreover, chapter-specific aspects of uncertainty are difficult to identify. We propose to deal with general aspects of uncertainty only in one or two chapters. The chapter-specific aspects of uncertainty might be additionally described in other relevant chapters. You may also wish to consider analysing the language used in the IPCC when discussing uncertainty and elaborating further steps in dealing with uncertainty. The IPCC uses qualitative “levels of confidence (comprised of “levels of evidence and agreement”) and quantitative “levels of likelihood”, if possible. Please see https://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf. Such terminology might also be helpful for IPBES.</p>	Germany	A paragraph on IPCC Guidance Note proposing qualitative “levels of confidence” and quantitative “levels of likelihood” was added to subsection 8.3.3.2., as well as reference to the new “Guide on production and integration of assessments from and across all scales” (Deliverable 2(a)). We have also reduced the treatment of uncertainty to what we feel it is essential for this chapter and reduced overlap on the treatment of uncertainty between sections 8.2 and 8.3.
5	8	General				<p>Chapters 1 and 8: There is a lack of consistency in the use of nature’s benefits to people vs ecosystem services between the two chapters. While chpt 1 uses nature’s benefits to people, chpt 8 almost only talks about ecosystem services, without motivating why. According to IPBES conceptual framework and the Preliminary Guide for Diverse Conceptualisations of values, ‘Ecosystem services’ is a sub-group of nature’s benefits to people.</p>	Marie Stenseke	We have added a sentence stating the equivalence of NBTP and ES, and refer to the IPBES CF framework on this equivalence (last line of the Introduction). We made this choice because the term “Ecosystem services” is much more common on the scientific literature of ecosystem service and scenario modelling.
6	8	General				<p>General: A useful chapter that brings together other chapters and presents more evidence to identify ways that IPBES could improve rigour and usefulness of modelling and scenarios. Some reviewers offered congratulations to the authors on their efforts and for producing such a thought-provoking piece, but added that there seems to be a bias to biodiversity and wondered if ecosystem services could be considered in more depth. It will need careful cross checking against previous chapters to ensure consistency, particularly the recommendations which</p>	UK Government	<p>Thank you for the positive feedback. We addressed the issues raised here throughout the document, and detail these in our responses to specific comments. Here are a few general notes:</p> <p>Regarding overlap w/key messages: see comment #2.</p>

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						<p>overlap those in other chapters, and under the dealing with uncertainties and communications subheadings. Uncertainties are laboriously described under two subheadings- which might be better shortened and merged.</p> <p>The goal or aim of the chapter is stated-p801, line 15, and this should precede the key findings and recommendations.</p> <p>Key findings must only be about what the evidence has shown, while the key recommendations should start with action words that respond to these findings. There must be a few lines to tell policy makers way this would be of benefit to them and what they would be required to do to realise these benefits. The last section 8.3.4 of the chapter does not really show much understanding of policy makers, which is a weakness. To work well with policy makers, IPBEs will need to increase understanding of the links with the policy cycle, as demonstrated in previous chapters, and also understand the priority issues for policy makers as deployment of resources is largely dictated by these. It is also very important to demonstrate the benefits, particularly in collaboration to deal with common issues. ‘Bordering Objects and institutions’ does not quite promote the feeling of sharing and opportunities for partnerships, yet sharing is where most of the benefits will accrue.</p> <p>On IPBES standard setting: the variety of modelling approaches and scenario building and uses matches needs and available data, particular questions being asked and trajectory of model development and accepted uses- so would it really be that beneficial to standardise it all into one mould fits all? Would it not lose sensitivity to particular circumstances, history and projected futures? If we all do things the same, there would be no moments of revelation and new breakthroughs, which would stifle innovation. It will be just as important to encourage new approaches for particular circumstances. IPBES could encourage innovation and research/ model/scenario development and form the hub to communicate new developments and applications, so that development and lessons learnt are shared.</p> <p>There is some very long text, which in places mixes evidence with a recommendation or two. It would be better to present the evidence under each subheading- and at the end bullet out recommendations or research needs, to give an overview of what might be necessary or practical in short and long term. It is</p>		<p>Regarding overlap on uncertainties /communication: see comment #4.</p> <p>Regarding the chapter structure and the style of key messages: these were determined by the Chairs of the assessment.</p> <p>Section 8.3.4 has been revised and condensed. We also opted to use “bridging institutions” instead of “boundary institutions”.</p> <p>We agree that there is a trade-off between using standard approaches that allow comparable assessments (e.g., across regions) and using innovative approaches that allow new types of assessments. We tried to strike a balance by recommending both types of development.</p> <p>We reorganized section 8.2, and added subsection titles to add structure.</p> <p>We defined model pedigree in the text and explain that it should be evaluated for biodiversity and ecosystem service models. (See also comment 102).</p> <p>Regarding the general style: We made a number of changes. In addition, the style will also be checked by the editor.</p>

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						<p>also important to demonstrate why the recommendation would be beneficial, what would the improvement serve? There is a good example, p828, 20-21 about why it is important to engage stakeholders in scenario development.</p> <p>8.2 improving models It would be more accessible to table the issue-description-example- ref- recommendation.</p> <p>Thematic gaps could be more clearly structured; as some starting lines in paras do not immediately refer to the thematic gap, eg species interactions or geographical and temporal scales, functional links: ES- well-being, species-ES.</p> <p>Model pedigree is a measure of the confidence that the community has in the model and will be influenced by items such as: have the internal processes represented in the model been tested, has the model been found to be useful by a large section of the community, is the model transparent and it is clear how it works?</p> <p>P 831, line 9-10 about communications and using tables, graphics etc. is advice that could be applied to all of the chapters 1-8. There are some useful figures and table e.g. table 8.1, Fig 8.3.</p> <p>Style guide: delete however, keep passive voice, use bullets or tables where possible to provide lists or issues, research areas etc.</p>		
7	8	General				Satisfied with the chapter. No comments.	Yann Clough	Thank you.
8	8	801	All	848	All	To avoid of any further confusion, it would be nice if this chapter to be merged into previous chapters of scenarios and models, wherever may be applicable.	Mahmood Yekeh Yazdandoo st	The chapter structure was determined and approved by the IPBES plenary; and we are comfortable with it.
9	8	801	14	801	14	What is the definition of high-resolution data in both a spatial and temporal sense?	Andrew Wade, UK government	Depends on the context. For example, spatially, 100 m grid size may be high resolution for some questions and low for others.

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10	8	801	19	801	24	I would also suggest that we only just formulating a good understanding of coupled biochemical processing and the interaction with vegetation dynamics and biodiversity across a range of scales from the plot to the global. Are we only concerned with ecological processes? Should the term be 'ecosystem processes' rather than 'ecological processes'?	Andrew Wade, UK government	We use the term ecological processes in the general sense, referring to processes at all levels of organization (individual to ecosystem), and in both biotic and abiotic components, as well their interactions. We clarified this in the relevant section (8.2.1).
11	8	801	11	801	17	In this para the regional biases in coverage of biodiversity studies and monitoring were highlighted. It is important to identify the reasons for the biases, e.g. lack of local experts, lack of financial support, etc. This information will be useful for recommending focus of capacity building measures, scientific research and project funding. An initial assessment of the reasons for the biases will be useful for the regional assessments and for the task force on capacity building. If reasons can't be explored at this stage, some recommendations, how other IPBES assessments will have to deal with this issue in future would be very useful.	Germany	We have added a sentence identifying some of the reasons for the biases.
12	8	801	13	801	13	The gaps on information of social demand is an indication of the shortcomings in including social science and research on socio-cultural aspects in modelling and scenario methodology for biodiversity and ecosystem services. This is an important challenge to be addressed and should be made more explicit in the chapter e.g. by specific bullet points in key findings and/or recommendations. My following comments shows that this is indeed an issue expressed in many passages in chapter 8, however, on the whole remaining somewhat hidden.	Marie Stenseke	We added text to the recommendations about "research on including socio-cultural aspects in modelling and scenario development."
13	8	801	11	801	17	"... gaps in data availability" AND ACCESS.	David Cooper	added
14	8	801	21	801	21	"between" do you mean AMONG aspects of (B&ES), OR BETWEEN (aspects of B) and (aspects of ES). If former, use "among" for clarity	David Cooper	we clarified by deleting "different aspects of"
15	8	801	26	801	26	Bold sentence is too short and cryptic	David Cooper	clarified by stating what we mean by "bridging"
16	8	801	34	801	34	Perhaps: "scenarios can be improved through an iterative process that includes the steps of: engaging"	David Cooper	done
17	8	802	11	802	18	Can we really produce guidelines for the verification and	Andrew	We believe such guidance is important

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						validation of models? As an alternative, should we not allow open access to data and models and the evaluation of model performance and utility should come from the user community. Comparing model performance using objective functions is difficult.	Wade, UK government	and possible. However, we expect these to be generic, not restrictive. These may be similar to the guidance developed by IPCC for evaluation of climate models (Flato, G., et al. (2013) Evaluation of climate models. <i>Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change</i> . pp. 741–866. Cambridge University Press.). To reinforce the idea of generic guidelines we have removed the reference to standards in the key message and added the IPCC reference to the text.
18	8	802	39	803	5	The expert group on conceptualisation of values (3d) should also be included here, for the economic and socio-cultural aspects.	Marie Stenseke	addressed by including the expert group on conceptualisation of values (3d)
19	8	802	20	802	22	Instead of 10 yeas perhaps 5-15; and 50 or longer?	David Cooper	These time frames were meant as examples; addressed by adding "e.g."
20	8	802	25	802	26	Key areas Specific to BES ...” what about broader SDG context?	David Cooper	addressed by adding "(including those related to SDGs)"
21	8	802	15		16	The importance of using appropriate methods for dealing with uncertainty is reiterated in several chapters and examples of existing systems e.g. IPCC are discussed. As a result of the assessment can recommendations not include more concrete guidance on how to address this issue?	Brenda McAfee	Our recommendation is for an expert group to develop specific guidance. In addition, we provide specific directions of research to make this happen in section 8.2
22	8	802	3	802	4	A key task is to identify common metrics for monitoring, modelling and reporting of biodiversity and ecosystem services Whilst it is very important to develop metrics for reporting on ecosystem services , this is not a simple task and will require a considerable amount of work (probably its own task force). Given this is not a simple task it would be useful to make this clear in the key recommendations.	UK Government	Similar work is already ongoing (as discussed in section 8.1), and our recommendation is that IPBES builds on that work.
23	8	802	39	802	44	The idea of a task force is that it is time limited. I agree that regular review of available policy support tools and methodologies for scenario analysis is important but it is	UK Government	We edited all recommendations, which now only refer to expert groups that have already been approved by IPBES.

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						unlikely that a task force would be kept in place to do this especially not continually as IPBES budgets are limited. The concept of review needs to be framed within a realistic understanding of what is possible given IPBES's budgetary constraints.		
24	8	803	7			Not clear to me how we go from recommendations ending on p 803 line 5 to the text that starts here. Should be a header I think.	Mark Lonsdale	We added a section title ("Introduction").
25	8	803	12	803	12	Don't IPBES assessments also include the subregional scale to some degree?	Germany	We added "sub-regional"
26	8	803	18	803	19	<p>There is the need to integrate this graph into the understanding of the conceptual framework of the IPBES. I suggest the following graph, which gives clarity to the interscientific dialogue between science and indigenous knowledge i the context of scenario development and analysis:</p> 	Diego Pacheco	<p>We added "ILK" to the caption. This interface is not only about the interface between scientific and IL knowledge, but among all stakeholders and actors at different scales.</p> <p>A sentence was added in the caption explaining the dotted arrow in the figure and the iterative nature of the process, which is not evident at the very beginning of this chapter. The figure has been revised.</p>
27	8	804		806		This section focuses on biodiversity. Why this emphasis? Don't we also need to think about how to evaluate models of soil and water processes too, for example?	Andrew Wade, UK government	This section is about the open challenge of identifying common metrics for biodiversity. Standard variables for some biophysical processes have already been agreed by the scientific community (e.g. runoff, precipitation, evapotranspiration). There is also an on-going process to identify essential variables for ecosystem services. We added two references for the work on Ecosystem Services (Tallis et al 2012; Karp et al. 2015).
28	8.1	804	10	815	41	Much of this section seems to be traversing areas that the K&D TF should be covering. At the very least, this material – which	Mark Lonsdale	The assessment chairs are communicating explicitly on these

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						seems to me of high quality - needs to be absorbed into K&D TF outputs and the Guide for assessments ASAP.		issues with the K&D TF. Hye Jin Kim (from K&D TSU) attended our chapter meetings.
29	8	804	31	804	31	Add "...and supported by the Biodiversity Indicators Partnership (http://www.bipindicators.net/)..." before "to assess".	Thomas Brooks	done
30	8	804	17	804	18	Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. This problem should be better highlighted in the text, and might also be explicit in key findings and recommendations – see also following comments	Marie Stenseke	Addressed in key messages (see comments 12 and 18).
31	8	804	10	815	41	This section should reference and draw upon GBIF's GBIO (Global biodiversity informatics outlook).	David Cooper	We have added in section 8.1.3 a few references to Hobern, et al. (2013) <i>Global biodiversity informatics outlook: delivering biodiversity knowledge in the information age</i> . Global Biodiversity Information Facility (Secretariat).
32	8	804	28	804	28	"two approaches" Also page 806, line7 "an alternative approach..." Rather than present these as two alternatives, they are two complementary approaches that can and should be developed towards a more unified framework. It might be also useful to touch on some of the limitations of the current indicators which are so-what ad hoc. Perhaps a unified framework can be developed that includes a family of consistent indicators closely linked to the EBVS. In this context it might be worth referring to the GEO-BON facilitated work of Ferrier and Jetz.	David Cooper	We have replaced "two approaches" with "two complementary approaches". We also added a reference to the recent work of GEO BON on indicators closely linked to EBVS: GEO BON. (2015) <i>Global Biodiversity Change Indicators: Model-based integration of remote-sensing & in situ observations that enables dynamic updates and transparency at low cost</i> . GEO BON Secretariat, Leipzig, Germany.
33	8	804	10	815	41	Section 8.1 Improving Data This section is very important, as data underlie the ability to create useable models and scenarios. Mention is made in this chapter and in the SPM (page S12, lines 4-5) regarding "...on-line access to a wide range of data and modelling resources..." While true, however, many of these data resources have poor QC/QA and are poorly documented, often leading to many erroneous data entries which can sometimes be difficult to screen out as obvious errors. It would help if a set of criteria and protocols were to be developed to evaluate the quality /useability of such on-line data sources, perhaps for example by the Task Force on Data and Knowledge. This will become essential as more data are provided by citizen science and crowd	Ian Perry	We added text on the issue of data quality at the end of the section 8.1.3.1.

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34	8	804	13	807	26	<p>sourcing initiatives (e.g. page 808, lines 9-11).</p> <p>Biodiversity management requires different methods threefold. The first method is one that ensures the key components of biodiversity sustainably, and to add the process to fill the gaps, is the assessment of ecological deficiencies; the second method is that of conservation management by which especially protects certain species; the third method for the herein case, I would tackle me much more on assessing ecological deficiencies. An assessment of environmental deficiencies is not conducted in isolation from other planning processes, namely:</p> <ol style="list-style-type: none"> 1) The national plans of strategic actions for biodiversity 2) national action plans for climate adaptation 3) The assessment of governance 4) Evaluation of the effectiveness of the management 5) An assessment of the integration of protected areas. <p>Also, the design of a protected area requires the evaluation of ecological deficiencies.</p> <p>The start of the evaluation of ecological deficiencies includes the assembly process of the team, identifying additional stakeholders, the establishment of a data management system and development of an action plan.</p> <p>The assessment of ecological deficiencies continues the process below:</p> <ol style="list-style-type: none"> 1) Identification of the key components of biodiversity. <p>Through identification, we approaches and basic principles:</p> <p>Approaches:</p> <ul style="list-style-type: none"> - The rudimentary approaches / fine - Approaches by key biodiversity areas - Approaches by vulnerable species - Approaches to a zero goal extinction - Approaches to important bird areas - The approaches to areas of importance for plant species <p>The basic principles</p> <ul style="list-style-type: none"> - The choice of areas important for biodiversity - The choice of species and rare ecosystems and / or irreplaceable - The choice of species and vulnerable ecosystems and / or threatened - The selection of widely distributed species 	Ludunge Elias Abdullah	These are important points. However, they address issues that are beyond the scope of this chapter.

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						<p>- The selection of umbrellas or critical species - The choice of ecological functions and processes - The choice of species, sites and systems important to humans - The selection of sites that allow adaptation to climate change.</p> <p>2. The assessment of the ecological status by which the distribution must be evaluated, sustainability and threats Assess viability</p> <p>After the evaluation of occurrences, we must assess the viability of each of the occurrences based on the size of the case, the condition of the occurrence and landscape context of this case. This will lead us to the simple algorithm for the overall ranking.</p> <p>To assess threats</p> <p>The partnership on conservation measures developed a common taxonomy of threats to consider: The development, agriculture and aquaculture, energy, transport, the use of biological resources, human intrusion, changes in natural systems, exogenous invasive species, pests and pathogens, pollution and climate change.</p> <p>- Establish goals and objectives This is to define the goals and measurable objectives of preservation, considering the following:</p> <ul style="list-style-type: none"> • The ecological thresholds • The status and rarely threatened • Goals distribution • The categorical protection objectives • The goals of restoration • Goals connectivity <p>3. Evaluate the protection status With knowledge of the assessment of ecological status, it must look at the land and water protected in a broader context of landscape and seascape. It entails looking both protected areas and other conservation areas.</p> <p>The process for the evaluation of protected area categories, types of governance, effective management and distribution. When assessing the context of the protection and conservation,</p>		

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						<p>just look at all these areas, to understand how to connect to terrestrial and marine landscapes, as well as to integrate them into the broader sectoral plans and strategies .</p> <p>Regarding the category of protected areas, they can be classified according to their management objectives. For categories, we can refer to those of IUCN adopted by virtually all countries. For the types of governance, it is necessary to know who and how protected areas will be managed.</p> <p>There governance by the government, shared governance, private governance, governance by the people and local communities</p> <p>- Management Effectiveness The results of the effectiveness of management provide insight into how the occurrences of the key factors of biodiversity are well protected and managed.</p> <p>Elements for effective management:</p> <ul style="list-style-type: none"> • Background: - Meaning of protected area threats and regulations related to the environment. • Planning - Definition of the protected area and Planning • Inputs - the resources to implement the management of the protected area • Process - the way in which management is conducted • Outputs - application management programs, actions and services • Results - the achievement of objectives. <p>4. put the elements together</p> <p>We must gather information in layers. The gap analysis is to overlay biodiversity map with a map of protected areas and see where the deficiencies lie</p> <p>The goal is to define a network of protected areas that fully integrates biodiversity and maintain key services while minimizing threats.</p> <p>As for approaches, one can choose one of the following ones:</p> <ul style="list-style-type: none"> - No detailed maps 		

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						- With detailed maps - With detailed maps and software After this all the results of the evaluation of ecological deficiencies, we proceed to an analysis that leads to the gaps.		
35	8	807	21			CICES acknowledge that cultural ecosystem services are difficult to measure. Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. This problem should be better highlighted in the text, and might also be explicit in key findings and recommendations	Marie Stenseke	Addressed in key messages (see comments 12, 18 and 30).
36	8	807	1	807	26	Should bring in cross referencing to the IPBES conceptual framework about here.	Mark Lonsdale	We have added references to the IPBES (Diaz et al. 2015) in the introduction and also here.
37	8	807	16			Common metrics - In fact the Knowledge and Data TF is proposing a common set of indicators to go into the guide for assessments as I write.	Mark Lonsdale	We have expanded Table 8.1 with recent info coming from the TF on Knowledge and Data and the work of the recent AHTEG of the CBD on Indicators. We cite both in the text too.
38	8	807	1	807	13	DPSIR. Note that, yes, conceptually the SPfB2011-2020 does reflect the DPSIR, but in practice this is more complex, with many of the Aichi targets including components and indicators that reflect D/P, S and R (as illustrated by the graphs in Tittensor et al 2014).	David Cooper	We agree, but we think that in such a short summary explaining this complexity will be confusing and is not absolutely needed.
39	8	807	38	807	43	I thought that the distribution in PREDICTS is much better than those shown in Figure 8.2. (by the way, Fig 7.3 is also a good illustration of geographical bias)	David Cooper	We deleted Figure 8.2a, and added a cross-reference to Figure 7.3.
40	8	807	21			After “(MAES 2014)” insert “or the Final Ecosystem Goods and Services Classification System or FECS-CS (Landers and Nahlik 2013)” Citation: Landers, D. and A. Nahlik. Final Ecosystem Goods and Services Classification System (FECS-CS). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-13/122, 2013. http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=257922 ; http://gispub4.epa.gov/FECS/	U.S. Government	done
41	8	807	15	807	26	Agree on common output metrics. Also need to consider standardizing data inputs, documenting variants and tracking uncertainty. This is essential if statistics agencies are to adopt them. Models also require standard descriptions (metadata) to facilitate comparison and selection.	Michael Bordt	Metadata issues are discussed in section 8.1.2 and 8.1.3. We also added relevant text to 8.2.2.
42	8	807	31		33	As the IPBES does not undertake monitoring, rather than	Brenda	We revised the text as proposed.

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						improving monitoring programs the approach might consist of identifying critical gaps and promoting the enhancement of monitoring programs.	McAfee	
43	8	808	9	808	21	I agree that these approaches to obtaining data are exciting and needed, but what about the physio-chemical environment and new techniques to monitor that using micro-fluidic and ion electrode technologies?	Andrew Wade, UK government	These are included in the "data collectors and sensor networks" that we mention.
44	8	808	17	808	21	Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. This problem should be better highlighted in the text, and might also be explicit in key findings and recommendations	Marie Stenseke	The issue is covered in Box 8.1, Thematic gaps.
45	8	809	5	809	7	Others worth mentioning include the Committee on Earth Observation Satellites (http://ceos.org/) and the Earth Observation Network (http://earth-observation-network.org/).	Thomas Brooks	We added CEOS. We did not add earth-observation-network.org . because it is an incomplete news website.
46	8	809	7			Mention EU <u>Copernicus Programme</u> ?	UK Government	done
47	8	809	7		9	a recommendation- why is it important?	UK Government	We removed this sentence.
48	8	809	36			Data strategies and monitoring efforts tend to be targeted to meet policy needs-to influence these needs clear reasons why they are important for policy, what benefits and efficiencies are- and also clarity on what limitations will be. Better modelling will not be a very strong argument for such investment.	UK Government	We edited item 1 of Box 8.2 to address this.
49	8	810	16	810	17	The sentence presumes aggregation, but not al values are suitable for aggregation. Could other methods also be considered/explored or might it be identified as a gap?	Marie Stenseke	We do not understand how this sentence is related to aggregation.
50	8	810	13	810	17	Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. This problem should be better highlighted in the text, and might also be explicit in key findings and recommendations	Marie Stenseke	This is addressed in key messages (see comments 12, 18 and 30).
51	8	810	27		30	Recommendation, why is it important? What would be benefits, advantages?	UK Government	This sentence is deleted, and the rest of the paragraph was moved to section 8.2.1.2, subsection Linking biodiversity and ecosystem services.

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52	8	812	8	812	10	that biodiversity information needs to be “widely shared and transferred, and applied.” 8 In coming years, data release is expected to be more often required by funding sources and by 9 research journals, Also which impacts which kind of pressure, where, the most deteriorating urbanism, industrial, transportation, consumption data should be produced, shared and disseminated, which are relatively more important compared to pure biodiversity data in conserving biodiversity. AS IPBES has aimed to become more influential over biodiversity deteriorating policies the IPBES team should aim mainly the interest in classifying deteriorating human factors, such as wars, conflicts, urban crawl, heavy industry, energy requirement of affluent society. In other words not the natural scientists but social scientists and environment leaders should be enrolled in preparing IPBES tasks.	Eyüp Yüksel	We added brief mention of the need to share social data, in the first paragraph of section 8.1.3.1.
53	8	812	41	812	44	The advent of DOIs for data and encouragement to cite publications are good incentives for scientists to release data after a reasonable embargo period. What is more problematic are those data sets which are core to an institutions business model (for which the charge a license fee for access – this will require a new financial model for them to operate).	Andrew Wade, UK government	We added a sentence on the advent of DOIs for data, in section 8.1.3.1. The challenge that some institutions' business model relies on fees for access is discussed later in the same section, around "Creative Commons" licensing).
54	8.1.3.1	812	5	813	6	Data access limitations can probably not only be overcome by the incentives described in this para. It will probably require robust data sharing protocols, especially at the international level. The provision of some best practice examples for data sharing protocols could be very useful.	Germany	We agree. We restructured the boxes 8.3 and 8.4 as best practice examples for data sharing protocols.
55	8	812	5	813	6	This Section 8.1.3.1 is a useful discussion, but could be strengthened with discussion of Creative Commons licensing, to clarify that “open access” comes in many varieties. For instance, many institutions make data available open access for non-commercial use, but establish data licensing policies for commercial use, to strengthen data quality and currency. It would also be worth mentioning that the emergence of web services has removed some of the long-standing challenges with parasitic repositing and redistribution of data, because users can now consume APIs and thus retain currency and attribution back to the original data source.	Thomas Brooks	This is addressed in 8.1.3.2.
56	8	812	39			requires	UK Government	done
57	8	813	41	813	43	“These diverse 41 datasets are required to be converted into the	Eyüp	This is beyond the scope of our

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						most easily understandable form to be understood by the newspapers and tv channels” should be added. Such as CNN, BBC which communicate the White House, and UN Secretary general, and major EU governments permanently.	Yüksel	chapter.
58	8	813	8	813	34	Open access data need high quality metadata to describe methodologies and issues with the data.	Andrew Wade, UK government	We agree with the comment. However, metadata issues are already discussed in various sections. To avoid duplication, and to keep within the page limit, we did not add further explanation.
59	8	813	12		45	Would be more accessible if tabled: Issue-text-improvements-advantages- reference or example	UK Government	The complexity of the issues precludes a table format, which in any case would be redundant with the key recommendation/key finding format required by the assessment chairs.
60	8	814	7	814	10	Yes, “...the global overview of the estimates of monetary values of ecosystem services, potentially benefiting local stakeholders who are unfamiliar with environmental economics.”. However no one cares about the monetary value, or the potentially benefiting local stakeholders most of the time has no power over the top level policy makers influenced by mostly by the rich, not the widespread voters and local stakeholders, even indigenous people and protected areas people. Therefore this measure, in my opinion, does not work.	Eyüp Yüksel	We disagree. The IPBES conceptual framework includes intrinsic, instrumental and relational values. Instrumental values are akin to economic valuation.
61	8	814	29	814	41	Databases of SOLUTIONS required here, such as system of protection of birds under the danger of aircraft flights, and also the danger of birds over the aircrafts. Alternatively, as being the IPBES body, we will be able to prepare such a GUIDE in keeping ecosystem services provided by biodiversity by preparing and implementing such practical and technical ways in stead of stressing the importance of monetary value.	Eyüp Yüksel	This is beyond the scope of this chapter.
62	8.1.3.2	814	31	814	42	You might add the “Global Register of Migratory Species (GROMS)” developed in the context of the Convention on the Conservation of Migratory Species of Wild Animals (CMS): www.groms.de	Jens Mutke	We thank the reviewer for the suggestion. However there are many databases that could be cited here. This one was not included it in the table. We chose some of the most developed and general databases currently available to provide an overview of the field.
63	8.1.3.2	814	31	814	42	You might add the BISAP Database (Biogeographical Information System on African Plant Diversity) developed in the context of the BIOTA Africa Network, which includes record based distribution data for c. 6000 plant species across	Jens Mutke	See comment #62

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						Africa (http://www.biota-africa.org/Metadata_main_ba.php?detail_id=324) compare e.g. Küper et al 2004 in Annals of the Missouri Botanical Garden 91; Burgess et al. 2005 in Biodiversity and Conservation; Scholes et al 2006 in UNEP Africa Environment Outlook II;		
64	8	814	1	814	4	Expresses difficulties when it comes to cultural ecosystem services in modelling and scenario construction. This problem should be better highlighted in the text, and might also be explicit in key findings and recommendations	Marie Stenseke	Addressed in key messages (see comments 12, 18 and 30).
65	8	814	29	815	35	Boxes 8.3 and 8.4 would be more useful with a little more annotation to indicate contents of these databases.	David Cooper	We added annotation.
66	8	814	1		4	Would be more accessible if tabled: Issue-text-improvements-advantages- reference or example	UK Government	see comments 58 and 59
67	8	814	13		15	An important recommendation that should be pulled out inot recommendation list	UK Government	This is already covered in Key Recommendation #1. We edited the text on p.814 to make this clear.
68	8	814	17			delete 'drastically'	UK Government	done
69	8	814	22			Recommendation, why is it important? What would be benefits, advantages?	UK Government	We deleted this sentence and restructured the previous one (not as a recommendation), and cross-reference Chapter 7.
70	8	814	25			Delete 'because'	UK Government	We deleted the sentence.
71	8	814	25		27	recommendation to address the challenge- pull into a list	UK Government	We deleted the sentence.
72	8	814	29			Box 8.3 is useful, but links don't work	UK Government	We checked each link again for the new draft, and corrected the one link that did not work. We also removed links for web sites or projects that did not allow free download of relevant data.
73	8	815	44	826	9	In section 8.2.1 would be relevant to refer to DIVERSITA science plan to 2020 (Larigauderie et al Current Opinion in Environmental Sustainability 2012, 4:101–105)	David Cooper	Although the topic of this paper is relevant, the recommendations it makes are too generic, more challenges than specific improvements to models, which is the topic of section 8.2.

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
74	8	815	37		40	Issues for issue list/ table. Would be more accessible if tabled: Issue-text-improvements- advantages- reference or example	UK Government	See comment 59. We moved this paragraph to the end of the section 8.1.3.1.
75	8	815	47			Delete 'as previous chapters have demonstrated'	UK Government	done
76	8	816	10	818	45	I would suggest that another key gap is understanding connectivity within the landscape in particular between the terrestrial and freshwater ecosystems. For example, where should diffuse pollution mitigation measures be located to prevent downstream eutrophication?	Andrew Wade, UK government	This issue is more related to "linkage gaps" covered in section 8.2.1.2, so we added a paragraph to this section (see the end of the section titled "Coupling...")
77	8	816	19			Reference for models?	UK Government	The reference was at the end of the sentence; we moved it up to where the models are mentioned.
78	8	816	24			Reference for models?	UK Government	The reference was at the end of the sentence; we moved it up to where the model is mentioned.
79	8	816	30			Should start line with thematic group- Species interactions or scales? It started about scales, and changes to species interactions.	UK Government	The focus here is on species interactions; we edited the sentence to mention "species interactions" in the first line.
80	8	816	36			Delete 'strong'	UK Government	we deleted "strong"
81	8	816	45	817	3	Recommendations that should be pulled out into recommendation list- together with why they are important and what advantages would be.	UK Government	We added a reference to species interactions and community dynamics to Key Finding #2.
82	8	817	3			new para, starts with research needs that would be more accessible if in bulleted list.	UK Government	We made this text into a highlights box, which is the common display item type for this deliverable.
83	8	817	11		20	Thematic issue is finding better ways to address the relationship between species diversity and ecosystem function- but gives no recommendation.	UK Government	We added a sentence to the end of this paragraph about new modeling approaches.
84	8	817	23		45	Restructure para- it mixes up research needs, availability to IPBES, reasons for gaps and promising directions for research. So, structure accordingly: what are evidence gaps, IPBES needs, and research directions?	UK Government	We restructured into two paragraphs, first on gaps and limitations, and second on promising research examples and directions.
85	8	818	21	818	24	"....One key research direction is to develop indicators that are firmly based on scenario analysis 21 and modelling so that future values of the index can be calculated for alternative policy options.". Here alternative polices may not be worked by	Eyüp Yüksel	We edited this sentence to reflect the need for models. The rest of this comment is beyond the scope of this chapter.

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						local decision makers, governmental policy makers, private sector, even farmers in need of money to live at an optimum level all over the world due to financial global economy's worsening policies, situations, and failures. So we have to design practical chain reactions to illustrate the fate of oncoming biosphere for all the social economic class by elaborately designed, most easily perceivable photographs taken from living examples, and the list of WHAT THEY (Both the rich, and the poor!) HAVE LOST, and WHAT WILL BE THE LOST ITEMS SOONER by them, at individual, enterprise, local managements, and governmental levels. In my eyes, elaborated perfectly prepared models, risk analysis, mathematical models will not be taken into account by the public, and rich, including governments and other UN bodies. We have to end preparing and circulating more complicated events schematic flow charts, tables, and maps (according to TEEB, and Millenium Ecosystem Assessment) preparation to be discussed, as even some of us cannot understands by looking instantly, i.e. , having a glance. These are boring as well (Though I like to read such illustrations! But I represent minority in this sense!).		
86	8	818	26	819	27	"....A critical research need involves the functional linkages between biodiversity and ecosystem 26 services". In my eyes (I am a protected area manager), policy makers and the layman, do not consider such a versatile an elaborate analysis of functional linkages between biodiversity and ecosystem 26 services, so it may be useless in keeping the ecosystem services of our planet constant, steady, and robust.	Eyüp Yüksel	The assessment of linkages between biodiversity and ecosystem services is part of the work program of IPBES.
87	8	818	14	818	25	Linking indicators to models. This implies a shift to an indicatr framework that is more systematic and founded on a consistent conceptual basis	David Cooper	We edited this section to reflect the need for models.
88	8	818	28	818	28	May be relevant to note that many decision makers also use shorter time frames	David Cooper	We edited this to acknowledge that short-term scenarios are also relevant to IPBES. (However, the paucity of research relevant to long-term scenarios is still an important gap, we kept the rest of this paragraph).
89	8	818	36	818	39	Re ag, fish, for. Very relevant point. Perhaps the CBD Technical Series 79 is worth referencing here. (application of scenarios to biodiversity across sectors)	David Cooper	We added this reference.
90	8	818	1		3	Recommendation that should be pulled out into	UK	This is mentioned in Key Finding 1.

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						recommendation list- together with why they are important and what advantages would be.	Government	Because we are limited to 5 recommendations, we are unable to explicitly mention this in a recommendation. However, we made this text into a highlights box, which is the common display item type for this deliverable.
91	8	818	9		11	Is this a recommendation for IPBES?	UK Government	We made this text into a highlights box, which is the common display item type for this deliverable.
92	8	818	14		15	Use bullet points to list research directions- this would then be handy for others to draw upon in considering research priorities and areas for funding	UK Government	We made this text into a highlights box, which is the common display item type for this deliverable.
93	8	818	41			Delete 'Second type of research need, change to 'There is a research need to make links concerning functionality between biodiversity and ecosystem function, human well-being and natural systems.	UK Government	We made this change.
94	8	819	7	819	13	Climate change adaptations in urban areas and rural areas as being the common intact unit would be classified as a one-to-one correspondence for each ecosystem service (particularly the regulatory ones!). In addition, ecological footprints of undesired human activities seen in urban areas versus each ecosystem service (provisional and regulatory) should be matched.	Eyüp Yüksel	We do not understand the change suggested by this comment.
95	8	819	26	819	39	Important gap in linkages between biodiversity and ecosystem services, and particularly how these are enjoyed by people, as well as demands for integrated multidisciplinary research – should be addressed in a bullet point on its own. Linkages to the deliverable on conceptualisation of values	Marie Stenseke	Bullet points are not used in this report. However, we now put this discussion in its own subsection "Linking biodiversity and ecosystem services", so the topic is prominently emphasized. We added a reference to the deliverable on the diverse conceptualization of values, and also made this text into a highlights box, which is the common display item type for this deliverable.
96	8	819	41	820	0	This discussion is only about quantitative approaches. I suggest something about development of qualitative approaches is added, since that is appropriate to the problem raised in the former paragraph.	Marie Stenseke	We have added Box 8.5 to section 8.3 with a brief description of some qualitative methods used in scenario development.
97	8	819	19			Implying a gap of knowledge in social science and how to integrate socio-cultural research and quantitative dominated scenario techniques	Marie Stenseke	Yes, this is the intended message. We made this text into a highlights box, which is the common display item type for this deliverable.

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
98	8	819	30	819	30	Perhaps this is overstated! Other ES and HWB links are prteey clear!	David Cooper	It is true that links between ES and HWB are clear. But the focus here is links between <u>biodiversity</u> and ES. After discussing this with the CLA of Chapter 5, we believe that our statement is not an overstatement. But, to prevent similar misunderstandings, we added a subsection title here to make clear that we are focusing on "Linking biodiversity and ecosystem services"
99	8	819	1		24	Para is too long, cut into smaller chunks	UK Government	Done. This section is now 4 paragraphs.
100	8	819	19		23	Recommendation that should be pulled out into recommendation list- together with why they are important and what advantages would be.	UK Government	We made an addition to an existing key recommendation (the last one) to emphasize this research direction). The importance and advantages cannot be covered in the brief text of the key recommendation; instead, they covered in the section titled "Coupling social and ecological models."
101	8	820	41	820	42	First of all prioritization of ecosystem services protection difficulties versus the entire global policy, global economic drive should be matched by concrete terms and examples by means of listing them step by step after discussing by a Plenary Meeting arranged by IPBES Secretariat in due course.	Eyüp Yüksel	This is an important recommendation, but is much larger in scope than that of our chapter (which focuses on research directions) or even this deliverable (which focuses on scenarios and models).
102	8	821	9	823	20	I agree that it is important to build confidence in models, but along with evaluating model performance in terms of 'goodness of fit statistics' and ability to reproduce behaviours observed in experiments, field-based manipulations and long-term monitoring, then model pedigree needs to be assessed as this will also give confidence to those who can enact change. Model pedigree is a measure of the confidence that the commnity has in the model and will be influenced by items such as: have the internal processes represented in the model been tested, has the model been found to be useful by a large section of the community, is the model transparent and it is clear how it works?	Andrew Wade, UK government	We added this recommendation about model pedigree. This is indeed a valuable addition.
103	8	821		826		Some repetition with topics covered elsewhere in the document	Shane Orchard	We did our best to remove repetitions. Yet, without explicit reference to what

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						eg 8.2.2, 8.2.3		exactly is repetitive, it is hard to understand what the reviewer is exactly referring to.
104	8	821	1	821	7	Important point. The expert group on conceptualisation of values (3d) should also be included here. That means one way of getting inputs from economics and social science.	Marie Stenseke	We added the expert group on conceptualisation of values (3d) .
105	8	821	15			Change 'select' to 'determine' whether model gives <u>acceptable</u> results	UK Government	Done
106	8	821	19		23	recommendation that should be pulled out inot recommednation list- together with why they are important and what advantages would be.	UK Government	Done
107	8	821	30		31	recommendation that should be pulled out inot recommednation list- together with why they are important and what advantages would be. How cpuld standards be set, need clarity on what are limitations and barriers are for doing this.	UK Government	We have added some discussion points on the needs for standards and protocols for validating models and why it has not been done so far.
108	8	822	27	823	20	This section needs to better account for socio-cultural aspects. It seems only to account for biological aspects, and is too mechanistic to be applied on development in the human society.	Marie Stenseke	We now recognize upfront in the Introduction (section 8.0) that our chapter “has a focus on quantitative approaches to measure biodiversity and ecosystem services, and it follows often a natural sciences perspective”. This reflects the expertise of the authors. We also engaged Marie Stenseke and Sonia Ribeiro as contributing authors to have a perspective from the social sciences/geography on some topics. Therefore several sentences and even blocks of text on a social sciences perspective were added throughout the text. In the particular instance of this comment we felt it was not essential to add socio-cultural aspects.
109	8	822	31		33	Torte- says that validation leads to validation!	UK Government	We modified the sentence to explain that model validation needs clear predictions, robust methods and good data.
110	8	822				Gives details of types of validation to address- would be simpler as bulleted list. Sensitivity testing? Model pedigree and acceptance?	UK Government	Details are given for the different types of issues modelers have to address. We prefer not to add it to this presentation

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								to avoid having an overly long list of bullets.
111	8	823	22	826	9	Ditto – cf K&D TF	Mark Lonsdale	See comment #28. In addition, we checked this section (8.2.3) against chapters 4 and 6 of the IPBES Deliverable 2(a) <i>Guide on production and integration of assessments from and across all scales [Role of scenarios and models in assessment and decision support]</i> by P. Leadley, S.Ferrier, K.N. Ninan and R. Alkemade] to make sure there is no overlap. In this section, we added cross-references to appropriate chapters.
112	8.2.3	823	43	824	2	Besides the benefits described here, which emerge from an early involvement of stakeholders in the process of defining the scope of a model, other benefits could also emerge. For example, this could particularly include the increase in the acceptance of new models (and scenarios) and their inclusion in already existing tools, which are being used in the targeted user groups, thus raising the level of acceptance of any new elements among the user groups.	Germany	The section was reorganized and this suggestion added to the text.
113	8	823	22	826	9	Section 8.2.3 seems to be overlap with treatment of uncertainty in other chapters	David Cooper	Authors from different chapter have met and agreed on the scope of the treatment of uncertainty in each chapter. Chapter texts were modified accordingly for the final draft, in order to avoid overlap.
114	8	823	18		20	Does not make sense	UK Government	We rewrote the last sentence entirely.
115	8	823	35		44	Dealing with assumptions, a lits of what to do, no refernces and not a very clear recommendation.	UK Government	The section was reorganized. Part of this paragraph was moved to subsection 8.3.1.2. Appropriate references have been added.
116	8	824	12			Useful table	UK Government	Thank you.
117	8	825	4		16	Why not simply refer to previous chapters wher Local knowledg is covered?	UK Government	Cross-references to other chapters were added linking ILK paragraphs. Also,

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
							nt	most of this is now moved to 8.3.1.2.
118	8	825	28			dealing with surveyor effort?	UK Government	Surveyor effort is a part of the uncertainty resulting from the input data, but there are others (e.g. observation error). We chose not to be more specific in our general text.
119	8	826	21	826	22	Policy makers usually do not care about possible improvements of scenarios, as they are so pragmatic and in case they do not aware of they declare we cannot see the actual facts described by this given scenario. So it would be better to chose appropriate interval segments of the past as a kind of scenario which have been proved by the real lives, while listing the losts and gains comparative table for them in addition of listing which best/worse policy caused these results. I mean thay can only see and accept the lived one, that is past.	Eyüp Yüksel	We have expanded section 8.3.2 to discuss a wider range of policy intervention scenarios. A discussion of ex-post assessments (retrospective policy evaluation) is provided in Chapter 3.
120	8	826				Section 8.3 excellent	Shane Orchard	Thank you.
121	8	826	16			It is not clear why only quantitative models are mentioned here. The sentence could be deleted.	Marie Stenseke	We disagree. This sentence forms the link between 8.2 (which is mostly about quantitative models) and 8.3.
122	8	826	24	829	6	This section on including stakeholders comes late in the text, despite that fig. 8.1 shows the importance of having stakeholder engagement from the start, as is also well motivated in 8.3.1.2. I understand the logic of the present structure of the chapter but it could be considered if the section on stakeholder engagement could be before the sections on data and models. That would help to signal that data and models are not given, but also a result of choices and impacted by stakeholders (as is also expressed p. 828, line 43 – p. 829, line 6.	Marie Stenseke	We thank the reviewer for the comment, but after thoughtful consideration we felt that the current structure of the chapter better fits the explanation of the scenario development cycle as depicted in Figure 8.1, with data and models underlying the different parts of the cycle, and therefore coming first in the chapter.
123	8	826	24	829	6	Section 8.2.3 seems to be overlap with treatment of of stakeholder engagement in other chapters	David Cooper	Section 8.3.1.1 and 8.3.1.2 were merged and condensed to reduced overlap with other chapters. Here we take a more prospective position in terms of what should be done to improve scenarios development (e.g by enhancing legitimacy, salience and credibility) instead of revising existing methods for stakeholder engagement as in Chapter 7.

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
124	8	826	25	827	18	<p>Protected areas are increasingly isolated in fragmented landscapes, and are in complete disconnection from other economic and natural resources of the area. So they are less able to make the ecosystem services upon which humans and provide a buffer medium vis-à-vis climate change.</p> <p>It is really obvious that protected areas alone are not sufficient to safeguard the natural and human communities in the future. For this, we must develop a broader strategy that integrates protected areas in their landscapes and seascapes, as well as sectoral plans and development strategies.</p> <p>Stage one includes the creation of a small group, setting goals, establishing parameters to be followed and the creation of an effective partnership.</p> <p>With solid information, it looks first in detail the overall process for starting. It is a process that brings together partners who can plan the whole process and initiate the integration of protected areas process. It is important to identify the core group of partners and stakeholders at the outset, in order to develop a support and assurrer to the creation of an inclusive process. In this training, it is necessary to include representatives of the public sector, private sector, the civil society sector (NGOs) and other stakeholders are essential.</p> <p>It is also important to select individuals who collectively have significant basic skills, with key capabilities:</p> <ul style="list-style-type: none"> - Understanding of trends in the use of land, models, practices and policies, - Familiarity with the issues raised in natural resources, mainly planning, regulations and policies - Knowledge of a full range of conservation tools and protection - Familiarity with trends, distribution models and biological requirements of key species in the region, - Ability to use GIS software and handle a variety of data, - Knowledge of trends in the economy and business in the region, - Ability to develop, implement and evaluate strategic plans - Knowledge of the political problems of the moment and the decision-making process, - Ability to clearly articulate the objectives of the initiatives and 	Ludunge Elias Abdullah	These are important points. However, they address issues that are beyond the scope of this chapter.

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						<p>communicate with a variety of stakeholders</p> <ul style="list-style-type: none"> - Knowledge of financial management practices, including the search for funds and basic accounting procedures. - Ability to work together, even if the targets are not consistent with those of others. - Ability to remain neutral in the event of conflicts of interest between different groups. 		
125	8	827	21	829	6	<p>It is appropriate to involve stakeholders in the integration of protected areas for these reasons:</p> <ol style="list-style-type: none"> 1. Species Survival: integration helps to improve links between protected areas by creating biological corridors that allow species movements and flows of genes, from one area to another. This is particularly true when climate change begins to have an impact on many species and that they require greater options to migrate and move in the landscape; 2. To improve management: improve practices and management rules, such as the reduction of agricultural pesticides in nearby areas of protected areas, or back up important areas for drinking water providing many other benefits to society in addition to simply conserve biodiversity; 3. Appropriate Scale: some processes, such as hydraulic systems occur across broad landscapes and watersheds. The management is implemented at these scales is more likely to support protected areas as planning at site; 4. Ecosystem services: protected areas provide ecosystem services, integration ensures the sustainability of these services. Example: securing welfare, maintenance of drinking water, soil stabilization and pollination for agriculture, the establishment of buffer against natural disasters, securing a strong economy based on tourism and guarantee important fishing areas of support. <p>The importance of stakeholders in this phase is justified by the fact that with them we will develop, implement and monitor strategies in these types of actions - following:</p> <ul style="list-style-type: none"> - Change protection levels - Change management practices - Change laws and regulations - Changes in market incentives, distortions and Outsourcing - Change industry practices - Change the enabling environment - Changing the physical environment 	Ludunge Elias Abdullah	see previous comment
126	8	828	20		21	A good reason is given WHY it helps to engages stakeholder in	UK	Unfortunately, it is not always possible

Nº	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						scenario building- all other recommendations should be supported by WHY they are important and what advantages they would bring.	Government	to summarize the reasons in one sentence. In many cases, our recommendations need to be supported by several paragraphs of text, because of their complex nature. However, we attempted to summarize these in highlights boxes. For example, in this case, we moved this sentence to a highlight box.
127	8	828	33			Edit- For effective identification and engagement of stakeholders, it is important to:	UK Government	We edited as suggested.
128	8	829	21	829	28	The point in this section is crucial in many respects, that communities in natural and social sciences concerned with the future are rather isolated and intellectual fusion is well needed. It should be better highlighted and might also be more explicit in key findings and recommendations in the beginning of chapter 8.	Marie Stenseke	We added to a recommendation: "...interaction among social and natural scientists and multiple stakeholders."
129	8	829	21		28	Provide evidence first, move recommendations to list at end. Recommendations should be pulled out inot recommendation list- together with why they are important and what advantages would be	UK Government	See comment 128. We improved the paragraph by adding few short ideas on that direction. We therefore edited some text on the stakeholder section page 828 (lines 23-31) to support (evidence) what is said here to avoid duplication on stakeholders' involvement
130	8	829	22			Change 'on' to 'to'	UK Government	Changed
131	8	829	10	830	6	The integration, always with the participation of stakeholders, evaluates the economic social and cultural context. The economic context regards the sectors which are related to biodiversity, such as forestry, energy, transport and tourism. While the related economic sector is any activity that contributes to the community of the economy or the country that has a potential or real connection with the creation, integrity or management of a landscape or seascape, such as the urbanization and development, transport, energy, tourism, wildlife, agriculture and grazing, forestry and agro - forestry, fishing and aquaculture, water resources management sweet, waste management, values of land and water, land, ecosystem	Ludunge Elias Abdullah	These are important points. However, they address issues that are beyond the scope of this chapter.

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						<p>services.</p> <p>After evaluation of different economic and related sectors, we must see the socio - demographical, such as the tendency of the population and socio - cultural factors, such as the views of communities and their practices.</p> <p>In socio - demographic factors, there are factors that influence the actual changes in the distribution of human populations through time. We must ask these questions - after:</p> <ul style="list-style-type: none"> - What is the size of the human population in the landscape and seascape? and how is it distributed? - What are the trends over time? Is - that some areas have strong demographic trends? Is - what municipal and regional planning tables showed growth centers? What threats, constraints and opportunities this presents - it? - What is the relative health of these areas? What are the levels of poverty and malnutrition levels or infant mortality? - What are the main sources of income of local populations? Is - what they - are strengthened or weakened by the proposed corridors of connectivity or other integration strategies? <p>In the socio - cultural, there are factors related to societal norms, values, attitudes and beliefs that may have an influence on several aspects of the use and management of resources. Questions are those - one:</p> <ul style="list-style-type: none"> - What are the views and attitudes of communities - a - vis conservation? What support can bring communities to protected areas integration strategies, such as adding new corridors, vis-à-vis expectations of existing protected areas and regulatory changes in land use? What constraints and opportunities presented by these attitudes? - What marginalized groups in the area? indigenous groups? What of gender equality issues? - Which areas are important for social, cultural and / or economic? For example, there was - there recreational areas of great importance, spiritual or aesthetic? Is - what there is particularly important areas for economic reasons? <p>For each sector, there are basic issues to consider such as the total economic contribution of an industry and future development plans, these issues are:</p> <ul style="list-style-type: none"> - The contribution brought by each sector, measured by GDP (Gross Domestic Product) - The players in each industry, if any, or a particular corporation 		

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						<p>that dominates the landscape or seascape</p> <ul style="list-style-type: none"> - Future plans for the use of the resource within the designated area for the corridor initiative, if compatible with biodiversity conservation objectives. - The management of invasive species. - Climate change - Legal environment including not only the strengthening of laws at local and national level, but also in the courts. - Cross-sectoral communication, commitment and coordination, which is related to the degree to which agencies and sectors communicate and develop coordinated plans for natural resource management, including those related to the formation of an integrated terrestrial and marine environment. <p>Finally, when assessing the wider context, it also assesses regulations and regulatory issues related to the environment. This can be defined as procedures, norms and belief systems that support and influence regulations on natural resources, as far as the regulations in them - selves. Examples of related regulations and broader rules on environmental laws on land planning, development plans, regulations, forestry, fisheries, mining extraction, infrastructure and energy, national and local environmental and building practices laws.</p> <p>Do not forget also to identify the positive and negative impacts associated with regulations on protected areas. For example, the impact of agricultural subsidies, rules relating to agricultural leases and the land use planning process.</p>		
132	8	830	8			Define normative –remember this is for non-specialists	Mark Lonsdale	This section was extensively rewritten and expanded. We no longer talk about normative scenarios as we use a common typology agreed with Chapters 1 and 3.
133	8	830				In 8.3.2.2 suggest linking this new terminology (‘normative scenarios’) with the related terms and discussion earlier in the document (especially the term ‘intervention scenarios’) to improve consistency. Also update similar in summary at beginning of chapter.	Shane Orchard	Good point! We have revised the terminology and now refer to exploratory versus policy intervention scenarios to be consistent with other chapters.
134	8.3.2.2	830	24	830	26	Which new IPCC scenarios are meant here? To our knowledge, the IPCC decided in 2006 for its Fifth Assessment Report (AR5) to rely on scenarios being developed by the research community and to limit its role to catalyzing and assessing	Germany	We have clarified these are the RCP scenarios used in the 5 th Assessment Report and added references.

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						scenarios (see Item 5 and Annex 4 in the Report of the IPCC's 25th session http://www.ipcc.ch/meetings/session25/final-report.pdf).		
135	8	830	5			change 'speak' to 'address'	UK Government	This sentence was deleted
136	8	830	9		10	A good point that could be applied to all Chapters.	UK Government	A consistent typology for scenarios was agreed at the 3 rd author meeting (Beijing) to be applied to all chapters. The revision of this section also reflects that typology.
137	8	830	23		24	Provide evidence first, move recommendations to list at end. Recommendations should be pulled out inot recommendation list- together with why they are important and what advantages would be	UK Government	We have now for each section added a highlight including a couple of sentences about the what and why of the main recommendation in that section.
138	8	830	36		37	Provide evidence first, move recommendations to list at end. Recommendations should be pulled out inot recommendation list- together with why they are important and what advantages would be	UK Government	We don't understand because there is no recommendation here.
139	8	831	5	831	6	Uncertainties are relatively unimportant, but the intention is the determining, key point here. We must accept the realities, and behavioral patterns of human beings, the consumers, irrespective of their policy making power, authority, richness, geographical, and social stratification level.	Eyüp Yüksel	We disagree that uncertainties are unimportant. They are important to determine the likelihood of an event or action. IPCC has made the treatment of uncertainty an key aspect of their assessments because of this.
140	8	831	6		8	Provide evidence first, move recommendations to list at end. Recommendations should be pulled out inot recommendation list- together with why they are important and what advantages would be	UK Government	We have now for each section added a highlight including a couple of sentences about the what and why of the main recommendation in that section.
141	8	831	10			More on uncertainty- in relation to comms, perhaps uncertainty could be dealt with under one subheading?	UK Government	Authors of various chapters met and agreed on the scope that the treatment of uncertainty for each chapter. In Chapter 8 it is about how to reduce all categories of uncertainty and how to improve communication of uncertainties.
142	8.3.3.2	832	10	833	11	It is important to communicate uncertainties. But it is just as important to communicate, how to cope with uncertainties in the development of policy options and actions. It would be	Germany	Chapter 8 is not about the development of policy options and actions but about "Improving the rigor and usefulness of

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						appreciated if examples for coping mechanisms could be provided.		scenarios and models through ongoing evaluation and refinement”.
143	8	833	34	833	37	Yet an argument for the need to better include research on cultural aspects	Marie Stenseke	We believe that social and cultural aspects are important and that social scientists need to be involved in IPBES activities.
144		833	34		38	Provide evidence first, move recommendations to list at end. Recommendations should be pulled out inot recommendation list- together with why they are important and what advantages would be	UK Government	The paragraph has been modified to include IPBES recommendations regarding levels of confidence in findings. Our recommendations have been moved to the end of the paragraph. A new paragraph was added at the end of section 8.3.3.2.
145	8	834	35			BOs = boundary objects?	Marie Stenseke	Yes. We removed the acronym.
146		834	35			Delete 'finally' . Not too comfortable with 'Boundary Objects', shared projects are also important. What is missing is underatdning of poliucy nees and links with the policy cycle, priority issues that determine input of resources. Need to add the motivating and egnageing effect of demonstrating benefits to policy makers and how they can particpate- eg through collaboration and sharing model and scenatrios for common polcy questions accoss a range of policy areas- developing a model or scenario once could have uses for a range of policy areas in many counties.	UK Government	Deleted. We now present a definition of boundary objects as “collaborative products”. We also have added the following sentence: “Bridging institutions can also demonstrate the benefits and use of scenarios assessments.”
147	8	835	11	835	11	Insert ‘and ecosystem services’ after ‘biodiversity’	Gary Kass, UK government	Done.
148	8	835	13	835	13	Insert ‘and ecosystem services’ after ‘biodiversity’	Gary Kass, UK government	Done.
149	8	835	17	835	17	Insert ‘and scenario’ after ‘modelling’	Gary Kass, UK government	Done.
150	8	835	19	835	19	Insert ‘and scenario’ after ‘modelling’	Gary Kass, UK government	Done.

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151	8	835	21	835	21	Insert 'and scenario planners' after 'modelers'	Gary Kass, UK government	Done.
152	8	835	9	835	23	Need to add in bullets points about communicating model and scenario outputs and on communicating uncertainties (methods, understanding implications, handling uncertainties in decision-making)	Gary Kass, UK government	We added a bullet point on communication of model and scenario outputs as well as communication of uncertainties.
153	8	835	20	835	20	In addition, IPBES have to have at least one representative recruited by the IPBES Secretariat at each big, middle scale, and small sacela municipalities of all the Governments as being the implementing end points of the local ecosystem management all over the world. Meanwhiel each private sector company must recruit an IBES expert at its own company. These sub-branches must dynamicalla and continually communicate with the IPBES Secretariat at Bonn.	Eyüp Yüksel	This comment is out of the scope of this chapter.
154	8	835	17			Why just modelling methodologies – could it not be made broader, e.g. scenario methodologies?	Marie Stenseke	See comment 148.
155	8	835				Add demonstration of policy uses and benefits.	UK Government	See # 146.
156	8	835	9	835	13	In order to become a successful boundary institution, IPBES should facilitate and create conditions, frameworks and infrastructure for the development of policy relevant biodiversity scenarios. This can be achieved by: - Identifying key global biodiversity problems and questions to which assessments can develop effective and robust answers;	Marina Rosales Benites de Franco	Done.
157	8	v.1 comment 99				Increasingly data archives like e.g. figshare give datasets an ISBN number so that they can indeed be formally cited. I don't think that limited citation numbers really should preclude proper citation of sources.	EJ Milner-Gulland (EJMG)	We agree; we deleted this sentence, which could have been misunderstood as endorsing limited citation numbers as a valid reason for not citing data sources.
158	8	v.1 comment 171				Again, there is a lot of experience, lessons learned, and tools developed and tested in applied fields like forestry and fisheries – and at least some ties to services and well-being. Yet again the most relevant sources of information and experience are being discriminated against.	Piers Dunstan (PD)	We restructured and expanded this section, and added references. In addition, we asked the commenter to recommend specific references to cite, but did not receive a response.
159	8	v.1 comment				That is NOT misunderstanding probabilities. It is applying an asymmetric risk tolerance to a correct understanding of probabilities. And civil society is fully entitled to have an	Jake Rice (JCR)	The paragraph has been modified as follows: “Information involving probabilities is

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		240				<p>asymmetric risk tolerance for negative vs positive outcomes, even if it can be exploited by unscrupulous partisans (just like symmetric ones can be) This has been pointed out many times since Kahneman's work more than 30 years ago, but people seem to still use this misrepresentation of the findings.</p>		<p>often susceptible to biases and misinterpretations, as people have different perceptions of what is really meant. For instance, different levels of comprehension of weather forecasts given in probabilistic terms were detected depending on gender and age (Handmer & Proudley, 2007). Social and cultural factors may influence the interpretation of the probability of occurrence of a given outcome and the perception of the seriousness of possible non-desirable consequences. Research on cognitive biases and prospect theory (behavioural economic theory that describes the way people choose between probabilistic alternatives that involve risk) indicates that people have difficulty in correctly interpreting risks because they are more likely to act to avoid a loss than to achieve a gain (Kahneman & Tversky 1979; Kahneman et al. 1982; Kahneman 2011). IPBES deliverable 2(c) takes this into account when pointing to the fact that the way in which a statement is framed will have an effect on how it is interpreted; for instance, a 10% chance of dying is interpreted more negatively than a 90% chance of surviving. Hence, when assessing and communicating confidence for Executive Summaries and Summaries for Policy Makers, it recommends considering reciprocal statements to avoid value-laden interpretations, such as the example in Mastrandrea et al. (2010) about reporting chances both of dying and of surviving. It is advisable that the Task Force on Capacity Building encourages further research on cognitive processes</p>

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								that may help improve the communication of more precise information regarding uncertainties and risks in a probabilistic format..”
160	8	v.1 comment 247	827			Most of this section is pretty good, but that is a complete misrepresentation of the reasons why ABS was such a difficult issue for CBD (and will be for IPBES)/ The ABS issue is just one of countless manifestations of the issue of socio-economic inequity on scales from local to global. Engaging Indigenous Peoples was the <i>right</i> thing to do for many reasons, and I am in no way arguing against their presence But it did not accelerate a solution to any of the issues involved in ABS, and should not be presented as if their presence will simplify such issues. It would just as easily be argued their presence will made some things more complex. The problem was never that with the voices of Indigenous Peoples not in the room, there was a perspective that was missing in the equity debates. The perspective was always there and central to the WEOG dialogue with other Parties to the Convention. And the power-sharing and wealth-sharing compromises were made among Parties.	Jake Rice (JCR)	We deleted this example and replaced it with another example related to the issue of legitimacy: "... the high-quality information in Global Biodiversity Assessment (UNEP, 1995) was largely ignored by the governments"
161		v1. comment 53				Indeed they can be used that way. However, there are many easy ways to use such gridded data and have low power to reject bad models. It would be important to put in a few more lines of guidance on the need to ensure the gridded data AND het ways they are used have high power to reject bad models, and the explicit requirement that such power be actually demonstrated before models are called “validated”	Jake Rice (JCR)	This sentence was removed.
162		v1 comment 83				Imputation only works if the relationships that already exist in the data also cover the missing data. However, if that assumption is broken the imputation will lead to very strange outcomes. It is a circular argument & it should be used with extreme caution.	Piers Dunstan (PD)	We added this caveat. See also next response.
163		v1 comment 91				At the very least, there should be text for each of these data-gap-filling options which discusses how little or much power (in the statistical sense) each of the alternative methods would have in producing data from which trends in ecosystem services as well as in biodiversity could be estimated.	Jake Rice (JCR)	It is true that all approaches mentioned here (or in the rest of the chapter, for that matter), have advantages and disadvantages, and rely on various assumptions. Unfortunately, there is not enough space to discuss all the pros and cons of each approach. So, for each data filling approach mentioned here, we added a mention of its main drawback.

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164		v1 comment 96				The big problem with mapping approaches like InVEST is their static nature, which makes them unsuitable for forward projection and scenario modelling, particularly when modelling the effects of policy interventions which themselves are likely to alter the system. Is this worth saying?	EJ Milner-Gulland (EJMG)	InVEST can be linked to land-use models to provide forward projection and scenarios. Furthermore, we now clarify that for short-term scenarios, a model like InVEST can be used to screen policies which translate into different land planning options (8.3.2.2).