# Comment form for 2nd Review Phase of IPBES Deliverable 3c) Fast-track methodological assessment on scenarios and models Summary for Policy Makers

**Reviewers:**

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Hans Keune
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| 1 | SPM-HK | General | | | | Very useful synthesis of the main report. Still, it seems rather academic. Which simple but crucial IPBES policy questions can be addressed by scenarios and models? Clear illustrative questions would be good for clarification. The same goes for products and their concrete usability/purpose. E.g. the use of the narrative/deliberative potential of scenarios, e.g. in relation to values. | Hans Keune | Key findings under high-level message 1 now convey more explicitly how scenarios and models can address questions across different phases of the policy cycle. |
| 2 | SPM-HK | General | | | | Also simple guidance questions for assessment experts may be helpful: e.g., is the idea to apply scenarios and models, or to review the global knowledge base on the current status? (similar confusion was present in the valuation guidance development process) How does this e.g. play out regarding recommendation 3.1.2 on involvement of key actors? | Hans Keune | This guidance now provided more explicitly under "Guidance for IPBES and its task forces and expert groups" |
| 3 | SPM-HK | General | | | | Uncertainty is a crucial topic in this SPM and the main deliverable. Still, the way it is treated and discussed seems somewhat unbalanced. Uncertainty is mainly presented as a challenge to deal with. Uncertainty is hardly presented as an opportunity to explore different possible future | Hans Keune | Good point. Following sentence now added to Key Finding 1.2: "Exploratory scenarios provide an |

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| | | | | | | scenarios.<br>Presenting uncertainty merely as a scientific (gap) challenge overestimates the scientific capabilities of resolving uncertainty with more scientific research and underestimates the societal importance and challenge of accepting scientific uncertainty as an inherent characteristic of complexity and wicked issues such as biodiversity and climate change. The precautionary principle as an option for dealing with uncertainty on important societal issues is not clearly mentioned (idem for the large document). The societal relevance of dealing with uncertainty also warrants the involvement of societal actors/stakeholders in the effort of dealing with uncertainty, that is, not only leave it as a challenge to scientific experts only. | | important means of dealing with high levels of unpredictability, and therefore uncertainty, inherently associated with the future trajectory of many drivers." |
| 4 | SPM-HK | General | | | | Models may also function as reality checks for scenarios: to what extent are narratives corresponding with data based model predictions? This option seems absent in the SPM of perhaps only implicitly.<br>The specific function of models also depends on their quality: the 'predictive' potential of models as simplified, abstractions of reality may be reduced under high uncertainty. Such models require careful participation of stakeholders and should be considered more as deliberation support or inspiration than plausible predictions of the future. | Hans Keune | Greater emphasis now given throughout SPM to participatory approaches, and to importance of recognizing, assessing and communicating limitations of models, and associated sources of uncertainty. |
| 5 | SPM-HK | General | | | | The above comments for the SPM partly also apply to the main deliverable text, especially concerning clarity on the policy relevance of scenarios and models, clear guidance question for assessments, uncertainty and models as reality check. | Hans Keune | Addressed within relevant chapters. |
| 6 | SPM | General | | | | In the summary, there are too many flow diagrams and process charts. This section needs to be much simpler.<br><br>Importantly, in the initial, up front summary, the key findings flagged in 2.1, 3.1, and 4.1 and the key recommendations flagged in 2.2, 3.2, and 4.2 , which form the actionable parts of the document, are all well done, reasonable, and useful. One could quibble over details of these findings and recommendations, but they hit the right high points and are consistent with comparable efforts, operational best practices, and the literature.<br><br>In many places, I though there were several bio-economic models, tools and DSS that were missing. A check for these seems warranted.<br><br>In the initial section, 4.1.1, state that we need to better leverage existing monitoring programs.<br><br>In the initial section, 4.1.5, state that not only the models, but the science | Jason Link | One flow diagram / process chart has been removed, and another has been converted to a table.<br><br>Regarding "missing bio-economic models" now made clearer that models mentioned in the SPM are examples only, and are not intended to be comprehensive.<br><br>Importance of better leveraging existing monitoring programs now addressed in guidance point |

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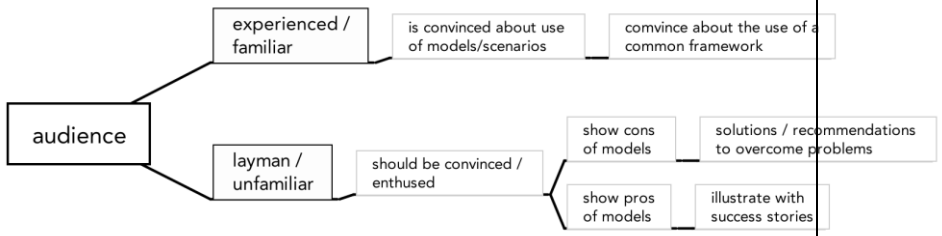
| | | | | | | needed for them should also be highlighted.<br><br>In the initial section, 4.2.1, state that also perceptions about models (and their validity) are also an impediment.<br><br>How does this link to other UN and inter-governmental efforts on the topic? Especially not only IUCN Red List of species, but also RLE? Perhaps could clarify. | | 5.<br><br>Importance of improving science (knowledge) to underpin models now addressed in guidance point 3.<br><br>Impediment relating to perceptions about models now acknowledged in key finding 1.4.<br><br>IUCN Red List programmes are not primarily scenario or model based, and therefore of peripheral relevance here (but they are dealt with to some extent in other chapters of the report). |
| 7 | SPM | General | | | | While the text is quite concise and exhaustive (useful synthesis of the main report), it is not presented as an appealing/accessible document (still very academic) that encourages to effectively apply models and scenarios and/or to be useful for policymakers. The SPM should be better geared towards the expectations of the target audience, some of who might be less (even unfamiliar) with models and scenarios. Those who are familiar should be convinced about the use of a common model/scenario framework. Those who are not, should be enthused about a scenario/modeling approach and informed about potential strengths and weaknesses. Simple but crucial IPBES policy questions that can be addressed by scenarios and models should be put forward.<br>  <br><br>The concerns about could be addressed by making a better use of cases to exemplify / elucidate (1) how scenarios and models may be valuable for | Belgium Government | The different types of audience targeted by the SPM (and the assessment as a whole) are now clearly articulated in the SPM's introduction. Findings and guidance for different audiences are also distinguished more clearly through division into "Key findings", "Guidance for science and policy" and "Guidance for IPBES and its task forces and expert groups".<br><br>Largest gaps in models and knowledge now identified in key finding 3.2 and guidance point 3. |

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| | | | | | | assessments and decision making, (2) the do's and don'ts of modeling. This might make the text less abstract. Now most of the findings and recommendations are rather vague and generally-worded. For example, S12, line 15-19 states *…indigenous and local knowledge 15 (ILK) because these **can** fill important information gaps, provide value to strengthen and consolidate traditional knowledge at multiple scales and contribute to the successful application of scenarios and models to policy design and implementation. There are **numerous examples** of successful integration of Indigenous and Local Knowledge (ILK) into scenarios and modeling;…* → you might use one of these numerous examples to illustrate **how** ILK can fill gaps etc.<br><br>Also - it would be nice to have a more quantitative overview of the availability of models and knowledge for the different elements of the conceptual framework: where are the largest knowledge gaps in the conceptual framework? Which kind of models (e.g. linking nature to benefits) are most reliable?<br><br>Models may also function as reality checks for scenarios: to what extent are narratives corresponding with data based model predictions? This option seems absent (or at least not clearly mentioned) in the SPM<br><br>Finally - uncertainty is a crucial topic/major outcome for this SPM. Still, the way it is treated and discussed seems somewhat unbalanced. Uncertainty is mainly presented as a challenge to deal with. Uncertainty is hardly presented as an opportunity to explore different possible future scenarios. Presenting uncertainty merely as a scientific (gap) challenge overestimates the scientific capabilities of resolving uncertainty with more scientific research and underestimates the societal importance and challenge of accepting scientific uncertainty as an inherent characteristic of complexity and wicked issues such as biodiversity and climate change. The precautionary principle as an option for dealing with uncertainty on important societal issues is not clearly mentioned (idem for the extended document). The societal relevance of dealing with uncertainty also warrants the involvement of societal actors/stakeholders in the effort of dealing with uncertainty, that is, not to leave it as a challenge to scientific experts only<br><br>The above comments to the SPM also apply to the main deliverable text, especially concerning language, clarity on the policy relevance of scenarios and models, uncertainty, and models as reality check. | | Uncertainty now addressed in more balanced manner throughout SPM – i.e. both as a challenge and an opportunity. For example, following sentence now added to Key Finding 1.2: "Exploratory scenarios provide an important means of dealing with high levels of unpredictability, and therefore uncertainty, inherently associated with the future trajectory of many drivers." |

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| 8 | SPM | General | | | | Unless I missed it, I didn't see a finding or recommendation about the limitations of (as opposed to the gaps between, or uncertainties arising from) models. [For example, are there some scales at which ecosystems and biodiversity are inherently unpredictable, and thus models ineffective?]. Thus a reader might come away with a false impression of the capability of models to be able to answer any question in an informative manner. To balance this, I recommend having a point, preferably in part 1, about what models cannot do, should not be expected to do, and will not achieve in the near future. A mismatch between inflated expectations for the results from models and the reality of what they can achieve could lead to friction between decision-makers and modellers. It is important to attempt to address this in the report. | Derek Tittensor | The importance of understanding and recognizing limits and limitations of models now emphasized in several places throughout the SPM. |
| 9 | SPM | General | | | | Overall: The headings used for sections 2 to 4 are findings in themselves, and this makes the whole SPM document hard to follow. The readability and flow of ideas could be improved by rewording these titles to highlighting just the core topics for policy makers to address. Then for each there are Findings and Recommendations given eg. for section 4 the core topic might be "Developing and applying scenarios and models for biodiversity and ecosystem services". | Shane Orchard | Addressed through major revision of SPM section structure. |
| 10 | SPM | General | | | | The SPM is generally written well, but some of the multiple recommendations on similar topics, for example, on uncertainty and ILK, could be integrated rather than repeated for slightly reasons. Also some of the figures are unclear without referring to the chapters (e.g. SPM.5 and SPM.6). The SPM should be understandable as a stand-alone document, so I would recommend either better explaining the figures, simplifying them for the SPM or omitting them. | Paula A Harrison | Repetition of recommendations reduced as part of major section restructuring.<br><br>Current work revising figures with graphic designer is ensuring that all figures are understandable without reference to chapters. |
| 11 | SPM | General | | | | The structure and style of the SPM, including the many illustrating figures and the rare use of technical terms, is highly appreciated. | Germany | Thanks. |
| 12 | SPM | General | | | | The provision of section titles in the form of headline messages is highly appreciated. All headline messages together can be used for efficient communication between and by stakeholders. | Germany | Thanks. |
| 13 | SPM | General | | | | If read carefully, a decision maker will find the expected information in this SPM. A careful read also reveals that the chapter gives answers to the key questions adressed by the report and the information required to follow up key recommendations. However, the style of presentation is condensed and technical. This may cause some readers to miss apsects of the general picture drawn up in the SPM. In particular, I see a need to | Per Arneberg | The different types of audience targeted by the SPM (and the assessment as a whole) are now clearly articulated in the SPM's introduction. Findings and |

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| | | | | | | describe the benfits of using of scenarios and models in a more accessible and less condensed style. This is important for convincing decision makers about the need of developing scenarios and models. If missed, this may of course hamper implementation of the key recommendations of the report. More detailed comments on this is given below. | | guidance for different audiences are also distinguished more clearly through division into “Key findings”, “Guidance for science and policy” and “Guidance for IPBES and its task forces and expert groups”. |
| 14 | SPM | General | | | | The SPM is in general hard to follow because the language style makes it very difficult to understand in many places. Thus, a clear purpose or message is hard to find that relates to an assessment of scenarios and models useful for IPBES.<br>The scenarios and models should be tools for IPBES to provide useful information for management of biodiversity. | Lene Buhl-Mortensen | The entire SPM has been restructured and revised to better target the different types of audience defined in the Introduction. Messages for IPBES are now also more clearly articulated through division into “Key findings”, “Guidance for science and policy” and “Guidance for IPBES and its task forces and expert groups”. |
| 15 | SPM | General | | | | General commetn on SPM: I feel that there is not much "meat" in this SPM. You need to give the reader a better idea of what models and scenarios are all about. Illustrate the range of S&M and how they are used. While the SPM provides some useful points on "process", the opportunity is missed to reach out to decision makers, explain what S&M are, what they can do and why they are important. This chapter needs a LOT more work in my opinion to reach its potential | David Cooper | The key findings under high-level message 1 have been thoroughly revised to provide more of “meat” in terms of explaining what scenarios and models are all about. Figures SPM.1, SPM.2, SPM.3 and SPM.4 have also been extensively revised, and their captions expanded, to help address this concern. Finally, addition of Table SPM.1 provides key examples of applications of scenarios and models to help illustrate the points made in the key findings. |
| 16 | SPM | Gener | | | | General comment on SPM: There is a redundancy between the key | David | The extensive restructuring |

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| | | al | | | | findings and key recommendations to the extent that some points come across as laboured. I am not sure that the KF/KR structure is working very well. | Cooper | of key findings and recommendations (now "guidance points") has now addressed this concern – i.e. findings and recommendations are no longer interleaved, but rather divided into three discrete sections: "Key findings", "Guidance for science and policy" and "Guidance for IPBES and its task forces and expert groups". |
| 17 | SPM | General | | | | General comment: There is a lack of consistency (and sometimes confusion) throughout the report concerning the typology of scenarios (sometimes three, sometimes four categories related to the policy cycle; sometimes, two, three, sometimes four groups (exploratory/predictive/normative, see Ch2; p216; line 29) as well as a lack of clear explanation of models versus scenarios. This reflects the lack of an overall conceptual framework across the report. | David Cooper | A consistent typology of scenarios and models has now been adopted throughout the entire report, including the SPM, and the conceptual framework for this is provided in Chapter 1. |
| 18 | SPM | General | | | | General comment: There is considerable overlap and redundancy across the report, eg … | David Cooper | Considerable effort has been directed to removing overlaps and redundancies between chapters. |
| 19 | SPM | General | | | | General comment: The SPM and Ch 1 are meant for a wider audience, while it is stated that the audience for other chapters is more internal: OK, but regardless of this, the whole report, and ESPECIALLY the KF/FR of each chapter need to be clear. This is not always the case. | David Cooper | The key findings and recommendations of all chapters have now been thoroughly revised to improve clarity. |
| 20 | SPM | General | ALL | ALL | ALL | Acronyms in diagrams. These need to be defined in full in the SPM or in an appendix section to the SPM. | Fundisile Mketeni | Acronyms used in SPM now defined in full. |
| 21 | SPM | General | | | | As often happens in detailed multi-author and multi-chapter report such as this, the roll up of Key Findings and Recommendations can come across as being too general (but probably the right level for non-technical readers). Also inevitable in such large reports is slight differences in terminology, e.g. socio-ecological vs. social-ecological (these seem to be applied to the same concepts but are different). | Ian Perry | Key findings and recommendations now made more specific through thorough revision and restructuring. Differences in terminology across chapters addressed as part of whole-report editing process. |
| 22 | SPM | Gener | | | | Too long; recommend to just focus on the headings of the key messages, | Louise Ann | The entire SPM has been |

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| | | al | | | | findings and recommendations preferably merging these<br>Clarify the expected audience in specific terms. At times it reads like it is a technical guidance and others it is speaking to higher-level decision-makers; then focuses its recommendations on the IPBES community. It is really a summary for the IPBES community? | Gallagher | restructured and revised to better target the different types of audience defined in the Introduction. Messages for IPBES are now also more clearly articulated through division into "Key findings", "Guidance for science and policy" and "Guidance for IPBES task forces and expert groups". |
| 23 | SPM and 1-8 | General | | | | (Same comments also included in sheet with REVIEW FULL REPORT)<br><br>Some chapters give author countries and others do not.<br>The chapters are very IPBES focussed- so how will support be drawn from policy makers, stakeholder and the science community? It really needs to sell the ideas of what is in it for them, what the benefits are- and greater clarity on what limitations might be. Budget holders need to appreciate gains and potential risks of investment. To make this volume of work useful it must have information that serves IPBES as well as the policy makers, scientists and others served by IPBES- otherwise it is a very good review of modelling and scenarios with a wish list for future development attached.<br>Key Findings must be in relation to what the evidence shown- with no added opinions or recommendations. Some chapters refer to relevant sections of the chapter which is helpful, while others do not.<br>Key Recommendations must start with' IPBES could:' and list the actions- starting with action words. They are justified by the Key findings, but must include what the benefits or advantages of each are - for IPBES, stakeholders and policy makers.<br>It may even work better to table Key Findings against Key Recommendations and a reference to the chapter section that they come from?<br>There is quite a bit of **overlap between chapters**, so consistency between them needs cross checking e.g. dealing with uncertainties, issue of scaling up or down. It is not necessary to reproduce text or rewrite versions of it- just refer to the relevant chapter and section.<br>**Policy** is mentioned many times, but no effort has been made to illustrate or list the number of policy applications identified in the literature, or make the point that scenarios and modelling can address single or multiple policy questions at once, including common policy questions between | UK Government | These comments relate largely to the entire report, not specifically to the SPM, and are therefore addressed in the separate response to reviewer comments for the whole report. |

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| | | | | | | different countries, so there are benefits in collaboration. The examples in the text could draw attention to the actual policy applications and what the benefits and limitations are.<br>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.<br>On standard setting: the variety of modelling approaches and scenario building and uses matches user 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.<br>**Methods**- a great deal of work has gone into the chapters, but the reader is given no indication of how the literature was searched, and how many papers were drawn into the summaries in each chapter- i.e. depth and strength of the evidence base. It would strengthen the arguments if there were some brief aims and methods at the start of each Chapter. There may be some misconceptions, because some governments do have modelling and scenario quality assurance guidance- for example the recently published UK guidance is called 'AQUA', which would not have turned up in a search.<br>It is an impressive volume of work, but **it would be more useful and <u>read</u> if it was made more accessible**, **and had clear focus on the aims of each chapter and what the whole was seeking to achieve**. It is not just about improving and using models and scenarios, but higher level objectives- to do this and influence policy making so that consideration of diversity and ecosystems are embedded in all policy areas towards achievement of CBD objectives. It is just one way, there are others, which may be more practicable and affordable, and so it is also important to be realistic and clear on limitations and resource requirements involved. | | |

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| | | | | | | **Style guide:**<br>Passive voice should be used throughout i.e. not 'we'.<br>Reserve the word 'key' for key findings and recommendations, delete or change to a different word, e.g. main, strongly evidenced, important, relevant, underlying, overarching etc.<br>Delete all 'however, therefore, moreover, furthermore' etc.<br>Reduce repetition and length of all chapters, avoid going into excessive detail. The chapters are not meant to be the handbook on how to do it, but serve to highlight where modelling and scenarios have been applied, the benefits, limitations and gaps.<br>Break up paragraphs, use simple sentences, use bullet lists or tables where ever possible to give a quick overview of findings- evidence, gaps, weaknesses strengths, data needs, applications, links to recommendations and benefits / limitations that policy makes might also be interested in. They are unlikely to want to read a 400 page report to find these.<br>A glossary is needed, and is mentioned in one of the chapters- where is it? All chapters will need to be cross checked to add entries, so that they are consistent. Then, each chapter could refer to the glossary for particular terms, e.g. direct/ indirect drivers. This would save some of the laborious and repeated descriptions. It would be possible then to past in a standard definition as a foot note, whenever a term is used.<br>It would be interesting to list the table of contents for each chapter in a table, to cross check against them for consistent style and coverage and make the cross links. | | |
| 24 | SPM | General | | | | **General:** The chapter is generally well structured and findings are presented with recommendations, but it does not read like a summary for policy makers, more a summary for IPBES. There is not much in the C1 setting context to tell us why modelling and scenarios and investment in their development or guiding good practice for regional/global assesments would benefit policy makers- what will they gain by it? It needs a stong clear openning line on this right at the start. The summary identifies 3 areas for development and it would help if these were clearly stated at the start.<br><br>The recommendations should be more general about the use of scenarios and modelling in assessments. They should say what needs to be done not who should do it. They should not be addressed specifically to IPBES. They should critically and objectively address the strengths and weaknesses of scenario and modelling approaches in different situations. | UK Government | The different types of audience targeted by the SPM (and the assessment as a whole) are now clearly articulated in the SPM's introduction. Findings and guidance for different audiences are also distinguished more clearly through division into "Key findings", "Guidance for science and policy" and "Guidance for IPBES and its task forces and expert groups". |

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| | | | | | | There is an assumption that the expert groups/task forces eg on models and scenarions, ILK, etc will continue indefinitely. (see for example the recommendations on page s10 line 5 onwards and line15. It is not given that these group will always be available if this is the case what other mechanisms could be put in place to address the recommendations made.<br><br>As this is a summary for decision makers there seems to be a lack of consideration as to how the scenarios need to be developed and verified through dialogue with diverse stakeholder groups – eg general public, farmers etc<br><br>This assessment takes a linear path through the conceptual framework Drivers->Biodiversity->Ecosystem Services -> Benefits and wellbeing, This potentially overcomplicates the problem. It implies that all drivers have to be modelled through all types of biodiversity and ecosystem. **The framing of IPBES is on wellbeing derived from nature**. So it would be more logical to start with the wellbeing aspects and then find out what is necessary/desirable/undesirable from biodiversity and ecosystems(=nature). Starting with the drivers makes the whole problem hugely complex with potentially a lot of redundancy.<br><br>The application of scenarios and modelling in IPBES regional assessments is potentially very broad. There is need to focus on the most important aspects of wellbeing and working back to biodiversity, ecosystem and direct drivers.<br><br>So for example, if you need coastal vegetation for storm protection, then all you need is the right vegetation on the coast. It does not need lots of biodiversity or the need to model all drivers in the system. Or, if you need to ensure flood control downstream, you need a certain area of flood plan and adequate vegetation on valley sides. This can be so much simpler if started from the good quality of life, rather than starting with biodiversity and its drivers. Most of this may turn out to be of relatively little significance for most people's wellbeing and is maybe more just the preoccupation of academic biodiversity scientists. Perhaps this aspect could be drawn out more in other chapters.<br><br>We need competition (variety) amongst our 'analytical conceptual frameworks' and hence of the models and scenario-buildings which match these frameworks. Yet there is no discussion in this assessment of the foundation framework (Fig 1.2), nor any reference of alternatives (a recent | | Recommendations have now been reframed as "guidance points", and divided into "Guidance for science and policy" and "Guidance for IPBES and its task forces and expert groups". Both sets of guidance points now emphasise what needs to be done, rather than who should do it, although guidance points for IPBES indicate possible roles for specific task forces and expert groups within the life of the existing Work Programme.<br><br>The "linear path" taken through the conceptual framework – i.e. "Drivers->Biodiversity->Ecosystem Services -> Benefits and wellbeing" was specified in the original scoping document for this assessment.<br><br>Consideration of alternative conceptual frameworks was not within the scope of this methodological assessment, which was bound to employ the approved IPBES Conceptual Framework.<br><br>The importance of understanding and recognizing limits and limitations of models now emphasized in several places throughout the SPM. |

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| | | | | | | review by Binder et al, 2013 is completely missing from the references. We need to harness our political and social constituencies to make the social choices about the 'fit' of these competing frameworks and their virtual 'secosystems' with the understandings and perceptions of the people (all of us) who will make the real world work (or not). This cannot be left to 'experts', who evolution tells us are more likely to be exactly wrong than roughly right.<br><br>Not clear whether the term scientists includes model builders, which as I understand can be a specialist skill and beyond that of many of the ecologists, biologists, economists, social scientists that woudl be involved in model building. I would expect that this specific training would be in high need in developing countries. This does not come through in the language here.<br><br>Not clear what is meant by a clear explanation of the limitations of modelling discussing uncertainites. Policymakers should be made clear on what models can and cannot do and what assumptions underlie them. If all this is intended to be captured under the term uncertainty, the text is inadequate.<br><br>**Editorial comment**: use alternative to colour in your graphics if you are going to distribute in developing countries | | |
| 25 | SPM | General | | S15 | | There is fluctuation of spelling of "indigenous and local knowledge". In some cases it writes "Indigenous and Local Knowledge" with capitalized initials, in other cases it writes "indigenous and local knowledge (ILK)" with acronym, or sometimes it writes just "ILK". These should be consistent throughout the document. | Ministry of Foreign Affaris, Japan | Now consistent – "indigenous local knowledge" throughout |
| 26 | SPM | S1 | 29 | | 40 | General comment – these two paragraphs address the audience as being largely non experts and this is laudable. However we find that the overall complexity of the subject of scenarios and models is such that non experts find it extremely difficult to connect with the subtelties of these technical tools. This is particularly problematic when considering countries that have a very low level of capability and or resource for the techniques identified. Ideally this summary should look at ways of addressing this by either identify a hierarchy of tools that starts from a simple approach and which can be built upon as skills and capacity increase, or by identifying ways and means for these countries to access external skills and expertise via the matchmaking facilities. The scope of the task force Knowledge and data should be reviewed in order to ensure that countries participating in the full work programme, particularly in assessments have the benefit of | Geoff Hicks | The different types of audience targeted by the SPM (and the assessment as a whole) are now clearly articulated in the SPM's introduction.<br><br>Potential for developing a common set of "IPBES scenarios" is now clearly addressed by IPBES Guidance Point 1. |

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| | | | | | | a common sets of IPBES scenarious in order to improve coherance and comprability across thematic, regional and global assessments. This position is consistent with and supports section 4.2.4 on page 15.<br><br>This document takes a very technocentric and potentially data hungry approach, with a high end requirement as to the quality of the models that should be used. It does not take into account the value of more participatory approaches that can be used at grass root level to engage and increase dialogue, to share world views and visions for BES into the furture or supporting decisions at the community level. While Scenarios more helpfully do this, there must some be some modelling approaches that can all operate at this level. These need to be clearly identified. Developing countries with limited capacity and capability should still be able to engage via a simple approach. | | The critical importance of participatory approaches now further emphasized in Guidance Point 2, IPBES Guidance Point 4, and Table SPM.2. |
| 27 | SPM | S1 | | S15 | | The SPM is generally in good shape. My main concerns are with the words used around ILK – and the words here are very important! Also there are some terminology issues which I feel may "faze" policy makers if they are familiar with other issues in the Biodiversity-related conventions, SDGs etc, so clarity and lack of ambiguity in the terminology used in the SPM is of critical importance. | Peter Bridgewater | Considerable effort has now been directed to clarifying, and avoiding ambiguity, in terminology used throughout the SPM, and the full report. |
| 28 | SPM | S1 | 25 | S1 | 25 | The word integrate is inappropriate for ILK, and would certainly not be "politic". The TF has tended to use "synergise", with which I also have difficulties. I would suggest "compare world views" in stead of "integrate ILK" | Peter Bridgewater | "integrate" now replaced by "mobilize" throughout |
| 29 | SPM | S1 | | | | Section 1. Further context on how this summary relates to other IPBES deliverables would be useful here. eg either include Table 1.1 (from Chapter 1) and/or related text showing how 3c fits into the wider IPBES programme and other guidance coming from it. | Shane Orchard | Context and linkages within broader IPBES Work Programme now better clarified in Introduction. |
| 30 | SPM 1 | S1 | 36 | S1 | 37 | See general comment regarding the division into key findings and key recommendations | Germany | Key findings and recommendations now more clearly structured as three discrete sections: "Key findings", "Guidance for science and policy" and "Guidance for IPBES and its task forces and expert groups". |
| 31 | SPM | S1 | 13 | | | -- "the use of the such methodologies in all work under the.....change "work"... to "activity" as "the use of the such methodologies in all | Sebsebe Demissew | This is a direct quote from an official IPBES document |

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| | | | | | | **activity** under the.....". | | and therefore the wording cannot be changed. |
| 32 | SPM | S1 | 14 | S1 | 16 | The second sentence in this paragraph to read as follows "Its one of the first IPBES assessments as it lays the the foundations for use in the regional, global and themetic assessments, as well as in other task forces and expert groups of IPBES" | Sebsebe Demissew | Not clear what change is being suggested, and why it is needed. |
| 33 | SPM | S1 | 26 | | | Insert the in ---Identification of means .....as "Identification of **the** means-----" | Sebsebe Demissew | Text no longer included in revision. |
| 34 | SPM | S1 | 29 | | | The first sentence to read as follows " This assessment also addresses other audiences in addition to the expert groups involved in IPBES activities such as …….(**examples of the activities would be useful**)" | Sebsebe Demissew | Target audiences inside and outside IPBES now defined in much greater detail in Introduction. |
| 35 | SPM | S1 | 32 | | | Change "The acritical analysis and .." to "The acritical **analyses** and..." | Sebsebe Demissew | Change implemented. |
| 36 | SPM | S1 | 19 | | | It should have aspirations for wider application: customised or best practice for national implementation | Kiruben Naicker | This broader target audience now clearly identified in Introduction. |
| 37 | SPM | S1 | 31 | | | Should link to the comment above | Kiruben Naicker | See above response. |
| 38 | SPM | S1 | 38 | | | For what purpose, if not for broader application, we should not have this differentiation between key findings and key recommendations: it is confusing. | Kiruben Naicker | Distinction between the purpose of key findings and key recommendations (renamed "guidance points") now clearly articulated in Introduction. |
| 39 | SPM | S1 | 24 | S1 | 25 | These are not the correct aims for the assessment. IPBES is not supposed to implement – member states and experts implement. IPBES is also not supposed to generate new knowledge – it can identify gaps, but not address them. This assessment can provide recommendations on how modelling can be incorporated into future IPBES assessments. | U.S. Government | This distinction now clearly addressed through the division of guidance points (formerly "recommendations") into "Guidance for science and policy" and "Guidance for IPBES and its taskforces and expert groups". |
| 40 | SPM | S1 | 26 | S1 | 26 | Suggest changing "work with" to "encourage" | U.S. Government | Change implemented. |
| 41 | SPM | S1 | 15 | S1 | 15 | Instead of "lays the foundation", recommend using the terms "provide guidance for". This more appropriately clarifies the role of IPBES and this assessment. | U.S. Government | Change implemented. |
| 42 | SPM | S1 | 19 | | | Although it is stated in line 29 that the audience goes beyond experts involved in IPBES activities, the broader audience should be identified | Brenda McAfee | The different types of audience targeted by the |

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| | | | | | | already in line 19. If the primary audience is experts involved in the IPBES expert groups and task forces, who, as experts would already be familiar with much of the material in the assessment, then the content could be reduced considerably. | | SPM (and the assessment as a whole) are now clearly articulated in the SPM's introduction. |
| 43 | SPM | S1 | 24 | | 25 | "Integration" limits the application of ILK unduly – ILK can be a frame in which to fit additional knowledge.<br><br>The narrow view of ILK persists throughout (eg section 4.1.3). ILK can fill at least two important additional roles important for scenario building: i) it can provide guidance regarding the extent to which scientific findings can be extrapolated (eg "are these findings likely to apply to another time or system?") ii) it provides context for the interpretation of scientific results – for example, if results are not found credible by ILK, the old adage about extraordinary conclusions requiring extraordinary evidence applies.<br>This has sometimes been described as the "zoomed in view" (western science) vs the "landscape view" (ILK). | ZuZu Gadallah | "integration" now replaced with "mobilization" throughout.<br><br>View on the roles of ILK now broadened in Key Finding 2.4. |
| 44 | SPM | S1 | 12 | | 40 | The statement assumes familiarity with IPBES. The context statement would benefit from a brief explanation of what IPBES is, what its assessments are intended to do, and who it is for. | UK Government | Providing a general introduction to IPBES is beyond the scope of this SPM. |
| 45 | SPM | S1 | 17 | | | Briefly describe what models and scenarios are and that each require different skills and knowledge to develop, but they are interrelated, see comments on pages 2, 3, and 6 | UK Government | Key Findings 1.1, 1.2 and 1.3 now clearly define models and scenarios and the interrelationship between them. |
| 46 | SPM | S1 | 26 | | | this should say the scientific community, policy makers and others. | UK Government | Text no longer included in revision. |
| 47 | SPM | S1 | 37 | | | Delete 'principle' as you have already termed them 'key findings' | UK Government | Change implemented. |
| 48 | SPM | S1 | | | | at end of page 1, it would help to give an overview of the areas where findings have led to recommendations, i.e. the headings of chapters 2, 3, and 4. | UK Government | Change implemented. |
| 49 | SPM | S1 | 9 | S1 | 40 | The language of the "context" analysis should be changed to a more policy making problem oriented, and keep in mind that this is written for PMs. The current text is not focus on this. | Yi Huang | "context" now removed |
| 50 | SPM | S2 | 24 | S2 | 27 | Mention of the use of normative scenarios | Gary Kass | Equivalence between "normative" and "target-seeking" scenarios now noted in caption for Fig |

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| | | | | | | | | SPM.2. |
| 51 | SPM-HK | S2 | 24 | | | *The term "scenario" refers to a consistent and plausible picture of a possible future* – so, no back-casting mentioned here in the SPM? The normative potential would be ideal for linkage to values and value systems and the related deliverable on valuation concepts. Perhaps good to also mention this in the SPM. | Hans Keune | Equivalence between "normative" and "target-seeking" scenarios now noted in caption for Fig SPM.2. |
| 52 | SPM | S2 | Fig SPM. 1 | | | Like almost all figures detailing the models the size of the biodiversity box indicates the total anthopocentric nature of the paper. The biodiversity box should be the largest as befits the causal element that has brought the convention into being. | Alan Feest | Fig SPM.1 now totally redrafted (by graphic designer), and the size of the "nature" box is equal to, or larger, than the other boxes. |
| 53 | SPM | S2 | Fig. SPM. 1 | | | Why are the "models" limited with 3 relationships in Fig. SPM.1? Might be an explanation that models can be used to describe any relationship between key elements of IPBES CP like economical model (RIOS) between nature benefits and good quality of life (Fig. SPM.3) although not specifically shown in the figure. | Gunay Erpul | Addition of "cross-sectoral modelling & integration" element in this figure is intended to convey that comprehensive assessment of good quality of life will often require integration of other types of models (beyond those considered in this assessment) from across multiple sectors. |
| 54 | SPM | S2 | Fig. SPM. 1 | | | Why is there no link between anthropogenic assets and nature in Fig. SPM.1? | Gunay Erpul | Because this link is not identified in the original IPBES Conceptual Framework, on which this diagram is based. |
| 55 | SPM | S2 | 19 | | 22 | Add "scenarios and models add interpretive power and value, particularly in circumstances of data deficiency." | Geoff Hicks | This finding now completely revised, making suggested change less relevant. |
| 56 | SPM | S2 | | | | Figure SPM1: A model icon should be added between the elements 'Nature's benefits to people' and 'Good quality of life' (e.g. socio-economic models that translate the benefits into different kinds of values (monetary and non-monetary) | Belgium Government | Addition of "cross-sectoral modelling & integration" element in this figure is intended to convey that comprehensive assessment of good quality of life will often require integration of other types of models (beyond those considered in this assessment) from across multiple sectors. |

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| 57 | SPM | S2 | 24 | | | *The term "scenario" refers to a consistent and plausible picture of a possible future* – so, no back-casting mentioned here in the SPM? The normative potential would be ideal for linkage to values and value systems and the related deliverable on valuation concepts. Perhaps good to also mention this in the SPM. | Belgium Government | Key finding 1.2 now makes it clear that the definition of "scenarios" considered in this assessment includes target-seeking scenarios (i.e. back-casting) and the equivalence between target-seeking and normative scenarios is established in the caption for Fig SPM.2. |
| 58 | SPM | S2 | SPM 1 | S2 | | I note that this version of the CF has left out some titles in the original? If this is deliberate i suggest ONLY the larger type titles are used to avoid complication and potential offence.. | Peter Bridgewater | Change implemented. |
| 59 | SPM | S2 | | | | Not clear what 'anthropogenic assets' are in Figure SPM.1. Why do anthropogenic assets feed into 'nature's benefits to people' rather than vice versa? The term is never defined; it is listed on p108 as anthropogenic assets (built, human, social, and financial), but still remains unclear what this actually is. Needs to be defined in all figures that use the term, and/or added to a glossary. This is covered in more detail in later chapters but needs to be defined here | Derek Tittensor | The use of "anthropogenic assets" and the linkages between this and other elements is drawn directly from the IPBES Conceptual Framework. It is assumed that most readers will be familiar with the CF, but a reference to Diaz et al is included for those who require further background on this. |
| 60 | SPM | S2 | | | | Need explanation of different colour shades for the rectangular boxes (e.g. why are some light blue and some dark blue)? Also explanation of categories definied by shape & colour (e.g. orange ovals, blue boxes, green & brown boxes) needed. Suggest having a legend on the figure to provide this context. | Derek Tittensor | This figure now completely redrawn by graphic designer so that this comment is now largely irrelevant. |
| 61 | SPM | S2 | | | | Line from 'direct drivers' to 'models' is missing an arrowhead; same for 'nature' to 'models'. | Derek Tittensor | This figure now completely redrawn by graphic designer so that this comment is now largely irrelevant. |
| 62 | SPM | S2 | 14 | S2 | 15 | Fig. 1 is useful because it integrates the roles that scenarios and models can play in the overall conceptual framework of the IPBES. Please indicate the interlinkage between knowledge and policy/decision making depicted in this figure by arrows showing in both directions. Reason for such arrows: Knowledge does not only contribute to decision-making, but decison-makers, by rasing questions and issues, can also actively contribute to knowledge and knowledge generation. | Germany | Changes implemented. |

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| | | | | | | Consistency of the figure with the IPBES conceptual framework and related figures e.g. in IPBES Deliverable 2a should be ensured. | | |
| 63 | SPM | S2 | 14 | S2 | 15 | "Governance" and "Institutions", included as boxes under "Indirect drivers", correspond neither to the usual understanding of indirect drivers and nor to the definition of indirect drivers in this report. We would appreciate some clarifications on this point.<br>Also a definition of anthropogenic assets would be helpful to better understand why it only impacts on regulating and provisioning services (and not on cultural and supporting services). | Germany | In redrawn figure this element now adopts precise label from the IPBES Conceptual Framework "Institutions and governance and other indirect drivers".<br><br>The use of "anthropogenic assets" is drawn directly from the IPBES Conceptual Framework. It is assumed that most readers will be familiar with the CF, but a reference to Diaz et al is included for those who require further background on this. |
| 64 | SPM | S2 | 26 | S2 | 26 | "Trajectories" and also "drivers" are technical terms. Please explain these terms in order to enhance understanding. | Germany | "trajectories" now removed from this caption.<br><br>"drivers" are further explained, through inclusion of bracketed examples, in Key Finding 1.2 and the right panel of Fig SPM.1. |
| 65 | SPM | S2 | 14 | S2 | 15 | In the graph there is a biased reference to the conceptual framework since only the concepts of science (in green) are introduced ignoring the concepts of knowledge systems (in blue). Therefore when mentioning to Good quality of life: human well being and **LIVING-WELL IN BALANCE AND HARMONY WITH MOTHER EARTH** should be included; also in nature's benefits to peoples in addition to ecosystem goods and services, also **NATURE'S GIFTS** should be included. Finally, when mentioning Nature also biodiversity and ecosystem and concetps of **MOTHER EARTH AND SYSEMS OF LIFE** should be included. Otherwise, we have a biased understanding of the conceptual framework only towards science which is not the purpose of IPBES. | Diego Pacheco | The concepts of science have now been removed from this figure. Only the "inclusive category" label is shown for each element – e.g. "Nature's benefits to people" – with illustrative examples of this element given in brackets (avoiding any mention of particular knowledge-system concepts). |
| 66 | SPM | S2 | 24 | S3 | 28 | The definition of "scenarios" given here and elsewhere in the document is as follows: | Olivier Thébaud | The relevance of MSE to the use of scenarios and models |

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| | | | | | | **"Scenarios:** The term "scenario" refers to a consistent and plausible picture of a possible future. This assessment 24 focuses on two broad categories: i) "explorative scenarios" that examine a range of plausible futures based on 25 assumptions about a range of trajectories of indirect and direct drivers and ii) "policy or intervention scenarios" 26 in which the consequences of specific policy choices or management interventions are explored."<br><br>This distinction can be related to the literature on Management Strategy Evaluation (MSE) which I think is particularly relevant to the IPBES endeavor, as it provides a conceptual framework for dealing with uncertainty in both the ecological and the human dimensions, and it allows for adaptive management strategies to be examined (see e.g. Nils Bunnefeld, Eriko Hoshino, Eleanor J. Milner-Gulland, Management strategy evaluation: a powerful tool for conservation?, Trends in Ecology & Evolution, Volume 26, Issue 9, September 2011, Pages 441-447, ISSN 0169-5347 or A. D. M. Smith, K. J. Sainsbury, and R. A. Stevens Implementing effective fisheries-management systems – management strategy evaluation and the Australian partnership approach ICES J. Mar. Sci. (1999) 56 (6): 967-979). In this literature, "scenarios" would correspond to the "explorative scenarios" mentioned in the SPM, i.e. plausible futures for direct and indirect drivers, while the term "strategies" would be used to characterize "policy or intervention scenarios".<br><br>The MSE framework distinguishes between models of (i) the key processes driving the dynamics of interactions between nature and human activities, and the outcomes (ecological, economic, social …) of these interactions, (ii) the ways in which these interactions are observed and their outcomes quantified and used in determining management options, and (iii) alternative management strategies and the uncertainty in the extent to which they are effectively implemented. I find this framework convincing, as it has been used successfully in applied settings, it provides a strong basis to work with stakeholders, and it fully addresses the uncertainty inherent in any natural resource management problem. It is increasingly being used around the world in supporting the management of natural resource harvesting, but also in broader integrated management settings such as coastal zone management policy.<br><br>It could be useful to include aspects of the MSE conceptual framework in the approach proposed here? For example,<br>- Should there be a direct connection between "anthropogenic | | within the context of IPBES is recognized explicitly within the full report – in particular detail in Chapter 2, but also in less detail in Chapter 1. But mention of this specific framework in the SPM is not considered appropriate, given that it is just one of a number of other similar frameworks for viewing the role of scenarios and models in decision-making. |

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| | | | | | | assets" and "Nature" in determining "Nature's benefits to people", through models? It seems to me that the approach in terms of "ecosystem services" is precisely devoted to combining knowledge we have of ecological functioning and of the ways in which people derive benefits from ecosystems to understand the consequences of ecosystem changes on human welfare?<br>- How can the feedbacks from changes in Nature and Nature's benefits to human activities (and pressures on ecosystems) be captured in the conceptual framework?<br>- "Knowledge" is placed outside the social-ecological system in the framework, but our observations and interpretations of information (be they scientific, indigenous or local) will feed directly into key stages of the processes leading from scenarios to expected changes in nature and to expected changes in nature's benefits to humans. In addition, this knowledge is likely to be revised as the scenarios unfold, and as we observe the consequences of what management strategies have been adopted. How could this be included in the framework? | | |
| 67 | SPM | S2 | 1 | | | Change "….to assessment.."……"to assessments…" | Sebsebe Demissew | "assessment" now removed from wording of this high-level message |
| 68 | SPM | S2 | 24 | S2 | 25 | Under Senarios: what are the diffrences between "a possible future" on line 24 and "plausible future" on line 25.<br>Is it not aslo better to add options after palusible future i.e **as plausible future options.** | Sebsebe Demissew | "possible" no longer included here. |
| 69 | SPM | S2 | 7 | S2 | 8 | Models form part of scientific knowledge. Perhaps all scientific knowledge is eventually some form of model of the kind you define on p101, l19-20. Suggest writing "numerical models" in this line, if this is what you mean. You may want to make sure to get the distinction between models in general and (complex) numerical models right throughout the report. | Axel G. Rossberg | Have tried to better clarify throughout the report that models can be either qualitative or quantitative, including definition of models provided in caption for Fig SPM.1. |
| 70 | SPM | S2 | 14 | | | "Human well being" was specified under "Good quality of life". It would be more inclusive if "Ecocsystem (biospheric) well being" is also specified. Admittedly assigning values to the latter is neigh impossible | Mochamad Indrawan | "human well being" no longer included under "good quality of life" – see response to comment 65. |
| 71 | SPM | S2 | 1 | S2 | 40 | **Figure SPM.1** should have two more boxes: (1) a box for Nature's threat to people adjoining Nature's benefits to people and (2) Updated knowledge through new findings of research linked up with the box on Nature | Jamal A Khan | The boxes are derived directly from those defined in the IPBES Conceptual Framework. |

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| 72 | SPM | S2 | 1 | S2 | 2 | Delete “assessment and decision-support” from this subheading. Scenarios and models should contribute to all four of IPBES functions (Page S5, lines 17-20), not just assessments and policy support. | Thomas Brooks | Change implemented. |
| 73 | SPM | S2 | 14 | S2 | 14 | The grey box in Fig SPM.2 for “Assessment and decision-support interface” should be separated into two, and arrows incorporated from the blue “scenarios & models” box up and down through “Assessments”, through “Decision-support interface”, and directly. This is because, as noted in the legend (lines 21-22) scenarios and models can inform and be informed by policy through assessments (without necessarily including decision-support interfaces), through decision-support interfaces (without necessarily including assessments), and directly (without either assessments or decision-support interfaces). | Thomas Brooks | Important point, which is now conveyed in words in the caption, while retaining a single box for “Assessment and decision-support interface” in the figure to avoid adding further complexity to an already complex diagram. |
| 74 | SPM | S2 | 14 | S2 | 14 | Ecosystems are part of biodiversity; it is a tautology to say “biodiversity and ecosystems”. In the bottom box in Fig SPM.2, please either say “Biodiversity, encompassing genetic, species, and ecosystem diversity” or similar, or else simply “Biodiversity”. | Thomas Brooks | The use of “biodiversity and ecosystems” throughout this report is based directly on the IPBES Conceptual Framework, where “biodiversity and ecosystems” are used to denote the scientific conceptualization of “nature”.<br><br>Also, following the CBD definition only the variability of ecosystems is part of biodiversity, not the ecosystems themselves. |
| 75 | SPM | S2 | 10 | | | Is this true, where is the quality assurance as there is evidence that some projections have reached their target dates but the projections/ predictions have not come true, eg, tipping points and thresholds | Kiruben Naicker | This text now removed. |
| 76 | SPM | S2 | 15 | | | Is there any starting point to the cyclic representation of the policy and decision making process: usually the policy and decision making process starts with a problem statement/ challenge in society. Cannot propose policy development just for the sake of it- it needs to address a specific problem otherwise its credibility suffers | Kiruben Naicker | This is clarified by the addition of Fig SPM.2, depicting all phases of the policy cycle, including agenda setting. |
| 77 | SPM | S2 | 14 | S3 | 9 | Figure SPM.1 is an important figure but condensed and not easy to understand. I suggest adding, in an easy-to read style, some examples of relevant models and scenarios that illustrate this figure and also show the benefits of using models and scenarios. The difference between not having | Per Arneberg | This figure now completely reconfigured by graphic designer. |

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| | | | | | | models and scenarios and having them should thus come out of these examples. As said above, this can be important for getting decision makers on board. I think it may be worth adding up to a page of text on this. | | |
| 78 | SPM | S2 | Figure SPM.1 | | | The flowchart (figure 1) that shows where models and scenarios are to be used, lacks a feedback loop from an assessment of management success (indicators of good state) to adjustment of management needed. | Lene Buhl-Mortensen | This is now addressed by the addition of Fig SPM.2, depicting all phases of the policy cycle, including policy review. |
| 79 | SPM | S2 | | S4 | | Ch. 2.1.1is referring to that scenarios and models can "provide valuable input...", and Ch 2.1.4 is referring to "general lack of understanding among decision makers about the benefits of using models and scenarios". Ch. 2.1.3 include several points on the benefits of using scenarios, however, there seem to be lacking a chapter on the benefits of models (e.g. compared to other studies/knowledge.) Hence, we suggest a new chapter after Ch 2.1.3 on the benefits of using models, or that Ch 2.1.3 is expanded to include information on this. | Linda Dalen | Benefits of using scenarios and models now articulated more clearly in Key Findings 1.1, 1.2 and 1.3, and through the addition of Table SPM.1. |
| 80 | SPM | S2 | 24 | S2 | 27 | Scenarios can refer to a past situation. In the frame of IPBES, it seems pertinent that only plausible future will be considered as scenario but the phrasing may be adapted so that this nuance is reflected. | Cécile Leclere | Unclear what change is being suggested. |
| 81 | SPM | S2 | 24 | S3 | 09 | Please define concepts should form part of section 1 in the SPM. That way it is easy to read the rest of the document.<br><br>Define scales (local to global) for common understanding of what is meant. Also show the hierarchy of complexity of scenario development or modelling | Fundisile Mketeni | Considerable effort has been directed to better defining concepts throughout the SPM.<br><br>Spatial scales are now also addressed more explicitly throughout the SPM. |
| 82 | SPM | S2 | 2 | S2 | 2 | IPBES should say "IPBES member states and the scientific community"; many of the actions identified in this assessment are not appropriate for IPBES to do and instead should be done by its member states and the broader scientific community. | U.S. Government | This distinction now more clearly addressed through the division of guidance points (formerly "recommendations") into "Guidance for science and policy" (broader audience) and "Guidance for IPBES and its taskforces and expert groups". |
| 83 | SPM | S2 | 14 | S2 | 28 | Figure SPM.1. For top line on "Policy and decision making", it would be helpful in the text to give specific examples of what kinds of decisions this model could be applied to. | U.S. Government | Numerous examples of "policy and decision making" informed by scenarios and models now |

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| | | | | | | | | provided in Table SPM.1 and Figures SPM.3, SPM.4 and SPM.6. |
| 84 | SPM | S2 | 14 | S2 | 28 | Fundamental elements of the Figure may need to be re-worked. 1) It is not possible to engage scenarios that do not go through models. No arrow does this from the first "Scenarios" orange bubble to the first "Models" orange bubble. But many Scenarios will encompass not just the link to Direct Drivers, but numerous links, all the way to Quality of life. Under the "Scenarios" paragaph in the text in the gray area accompanying the Figure, "consequences of specific policy choices...are explored." These must include the possibility of affecting "Good quality of life" which is not a clear option with the single orange "Scenarios" bubble at the top right of the blue-shaded portion. So the first Scenario bubble is inadequate. I pose that it is actually at the level of the light blue round-cornered box that "Scenarios" engage. *All* of the elements within the blue-shaded portion of the IPBES Conceptual Framework may be affected under different scenarios, so the blue-shaded portion *is* the scenario box.<br>2) Also in this depiction, following the function of the boxes with arrows, the orange-bubble "Models" between the blue boxes look like intermediate decision-making agents or actual conduits of effect or junctions of effect, rather than indicating that actual drivers are being modeled. This is an unfortunate but plausible interpretation from this Figure, but Models cannot have agency, and should not cause anything. The nature of objects in a flow chart have very specific functions to some readers, especially to those familiar with computer algorithms. It may help to make the "Models" shape more suggestive than firm.<br>I think you mean "Models" in a sense that they would have dotted (or no) outlines rather than solid outlines, and be circles through which *different types of arrows* pass (each depending on the model), for example from Direct Drivers to Nature. Then "Models" would either be labels for each arrow, or the *entire* space (perhaps in a bubble without a firm outline) between blue boxes currently linked by an arrow.<br>3) Also a good deal of the ecosytem services field, including most assessments, is attempting to model the degree to which "Good quality of life" is enhanced by "Nature's benefits to people." This undertaking includes all efforts attempting to gauge the *level* of value any person (or group) has for an ecosystem service. So that must be modeled as well, as it cannot be directly observed, or its influence directly measured.<br>4) Depending on the precise definition of Indirect Drivers, you likely need an arrow going *directly* from "Good quality of life" to "Athropogenic assets." Otherwise you exclude the possibility that without institutional | U.S. Government | This figure has now been thoroughly reworked, in collaboration with a professional graphic designer.<br><br>Regarding the specific suggestions made here:<br>1) Agreed that all elements are affected by scenarios but, in keeping with the original scoping of this assessment, "scenarios" here refers to either plausible futures of drivers, or to intervention options, and "models" are viewed as the means by which these scenarios are translated into impacts on nature, nature's benefits and good quality of life.<br>2) The orange "models" bubbles now removed, and replaced with labeled arrows.<br>3) Addition of "cross-sectoral modelling & integration" element in this figure is intended to convey that comprehensive assessment of good quality of life will often require integration of modelling of the contribution of nature's benefits with other types of models (beyond those considered in this |

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| | | | | | | intervention, a good quality of life supported by benefits from ecosystem services can lead to an increase in anthropogenic assets. For example, the lack of such an arrow excludes the (pre-historical, historically proven, and extant) cases of indigenous people trading staple seeds in informal settings, then growing them out at home. In this case the surplus seed in part afforded by ecosystem services and a "good quality of life" has led to the "anthropogenic asset" of the ability to manage a bank of genetic resources for food crops, in a traditional not-officially-coordinated-or-recorded (village-to-village) setting. That must be an arrow that does not engage intermediation by "institutions & governance" .Agreement with any of these suggestions would of course necessitate modification of related figures throughout the larger main document.<br><br>Here is a rough mock-up of a *detail* of Figure SPM.1 with these problems "solved" (I did not wrestle with Powerpoint's stacking of objects to get all of the labeling up front, but no objects are missing). I have largely maintained your chosen color scheme. As I indicated, multiple arrows are theoreticaly possible through the Models bubbles between blue boxes, but the figure is complicated enough without different types of arrow for different types of models. Notice now that a scenario might comprise any number of models that relate one blue box to another, as I believe was your intention: | | assessment) from across multiple sectors.<br>4) The arrows depicted in this figure are based directly on those defined in the IPBES Conceptual Framework. |

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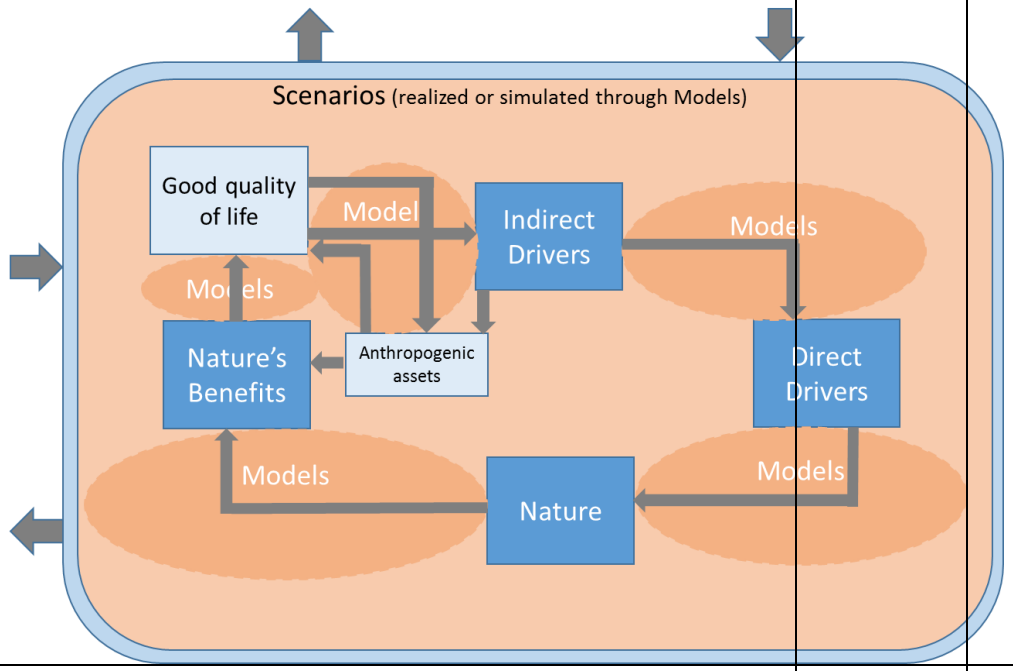
| | | | | | | Detail of "lower blue-shaded portion of the diagram" within "Broader social, economic & institutional context," Figure SPM.1:<br>  <br> | | |
| 85 | SPM | S2 | 6 | | 7 | For the policy maker who is not familiar with the IPBES conceptual framework it would be helpful to include a brief summary of the main relationships within the framework – i.e. the link between 'drivers', 'nature', 'nature's benefits' and 'human well-being'. | UK Government | It is assumed that most readers will be familiar with the conceptual framework, but a reference to Diaz et al is included for those who require further background on this. |
| 86 | SPM | S2 | 24 | S2 | 27 | Mention of the use of normative scenarios, and understanding existing systems | UK Government | Equivalence between "normative" and "target-seeking" scenarios now noted in caption for Fig SPM.2. |
| 87 | SPM | S2 | | S2 | | The conceptual framework diagram is different to IPBES'. Indirect drivers should be part of 'Institutions and governance'. This is where changes in the indirect drivers emerge from, so I think this is important. Otherwise it looks as though independent drivers are somehow independent of human decisions, and immutable. | UK Government | Change implemented. |

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| 88 | SPM | S2 | 14 | S2 | 16 | Better to add “Models” between Nature’s benefits to people and Good quality of life on the Figure SPM.1 that is also important as described in Figure SPM.3. | Ministry of the Emvironment, Japan | Addition of “cross-sectoral modelling & integration” element in this figure is intended to convey that comprehensive assessment of good quality of life will often require integration of modelling of the contribution of nature’s benefits with other types of models (beyond those considered in this assessment) from across multiple sectors. |
| 89 | SPM | S3 | 1 | S3 | 3 | Set out that models can be ussed to help gain understanding of an existing system or to help make predctions about future states of that system | Gary Kass | Now set out more clearly in Key Finding 1.3 |
| 90 | SPM | S3 | 11 | S3 | 17 | As above. Also mention the critical issue of uncertainties in modelling and the limitations of predictive power | Gary Kass | Uncertainties and limitations of models now addressed more explicitly in Key Findings 2.5 and 3.4, Guidance Point 4, and IPBES Guidance Point 5. |
| 91 | SPM | S3 | 19 | S3 | 28 | Note that scenarios and models are both attempts to gain some traction on an inherently unpredictable and unknowable future. This should recognise the wide range of different sources and types of uncertainty in any assessment and the need to avoid deterministic and positivist assumptions that are often found in integrated assumptions where issues of contingency, path dependency, context and actor agency are often squeezed out, downplayed or ignored. | Gary Kass | Now addressed to some extent in Key Finding 1.2 – i.e. “exploratory scenarios provide an important means of dealing with high levels of unpredictability, and therefore uncertainty, inherently associated with the future trajectory of many drivers”. Also dealt with in considerable depth throughout full report. |
| 92 | SPM | S3 | 14 | S3 | 15 | This kind of model is hard to understand, what is difference with the other two? | Fu Bin | Now reworded: “models projecting consequences of changes in biodiversity and ecosystems for the benefits people derive from nature”. |
| 93 | SPM | S3 | 23 | S3 | 30 | IPBES should consider the usability of the models. | Fu Bin | No better addressed throughout the SPM. |

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| 94 | SPM | S3 | 12 | | | 'Management practices' could also be seen as a direct driver (as it implies land use changes directly impacting on the ecosystem) | Belgium Government | "Management practices" now removed from this text. |
| 95 | SPM | S3 | 14 | | | Here, biodiversity and ecosystems are mentioned as the interpretation of 'nature'. The ecosystem level is one of the aspects of biodiversity, while the current phrasing these are two distinct features of nature. It could be rephrased as *… direct drivers on nature (e.g. ecosystems); …* | Belgium Government | The use of "biodiversity and ecosystems" throughout this report is based directly on the IPBES Conceptual Framework, where "biodiversity and ecosystems" are used to denote the scientific conceptualization of "nature".<br><br>Also, following the CBD definition only the variability of ecosystems is part of biodiversity, not the ecosystems themselves. |
| 96 | SPM | S3 | 11 | S3 | 15 | Note that models are beginning to be produced that span more than one of these categories, and that this trend is likely to accelerate. | Derek Tittensor | Addressed by addition of "their contributions will often be most effective if the three model types are applied in combination". The importance of achieving better integration across these model types (including through IAMs) is also addressed in Key Finding 3.3 and Guidance Point 3. |
| 97 | SPM | S3 | 11 | S3 | 11 | Add 'based on the aspects of human-environment systems they primarily address' after '... three broad classes...'. Rationale for the change: there are many ways of classifying models according to different criteria, so it is necessary to clarify which criteria are used. | Germany | This is conveyed more clearly by diagrams and caption in Fig SPM.1. |
| 98 | SPM | S3 | 15 | 3 | 15 | It might be useful to add that 'Human needs in terms of benefits derived from nature or perceived changes in the provision of benefits from nature trigger human responses to maintain or increase these benefits, and this translates into changes in indirect or direct drivers, closing the loop describing the sequence of causes and effects in human-environment interactions.' Rationale for the change: Cause-effect-chains in socio-ecological systems are often depicted as loops, and scenarios and models need to consider the feedbacks that societal responses to environmental | Germany | Potential for these feedbacks is now depicted more explicitly in Fig SPM.1 and the importance of developing models to address such feedbacks is addressed in Key Finding 3.3 and Guidance Point 3. |

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| | | | | | | issues have on indirect and direct drivers. | | |
| 99 | SPM | S3 | 19 | S3 | 19 | "when coupled with models" – Is this condition necessary? If it is, then we suggest that the dependence of scenarios on modells should be clarified in the following paragraph. If not, it should not be mentioned in the headline of this key finding. | Germany | This text now removed. |
| 100 | SPM | S3 | 19 | S3 | 20 | This key finding about the relationship between scenarios and modelss with the policy cycle should be visualised in a figure,e.g. simplified version of fig. 3.3 (page 311). | Germany | This figure now included (SPM.2). |
| 101 | SPM | S3 | 20 | S3 | 20 | Regarding uncertainties: In which part of the policy cycle: i), ii) and iii) would uncertainties emerging from intervention scenarios be addressed? | Germany | Relationships between intervention scenarios and the policy cycle now addressed more explicitly in new Fig SMP.2. |
| 102 | SPM | S3 | 3 | S3 | 3 | Benefits to people. The scenarios shall consider all knowledge systems as reflected in the conceptual framework of the IPBES (Decision 2/4). | Diego Pacheco | Reference to the terminology of any particular knowledge system in the "Nature's benefits" element of this diagram now removed. |
| 103 | SPM | S3 | 6 | S3 | 6 | …IPBES activities are based, considering that the conceptual framework is a tool for the achievement of a shared working understanding across different disciplines and knowledge systems. | Diego Pacheco | Reference to Diaz et al now included for readers interested in further background to the conceptual framework and its role in IPBES. |
| 104 | SPM | S3 | 5 | S3 | 9 | The IPBES conceptual framework describes the key components and relationships in human-environment systems, and is the foundation upon which all IPBES activities are based. The components are expressed both as "inclusive categories" (large letters in each blue box) as well as their translation, resembling the IPBES conceptual framework, into terms that are commonly used in the scientific literature (in small letters), and into terms used by other indigenous and local knowledge systems is translated in small italic letters. | Diego Pacheco | Translation into scientific terms no longer included, only the "inclusive categories". |
| 105 | SPM | S3 | 7 | | | Replace "large letters" with "large font" | Cornelia Krug | Change implemented. |
| 106 | SPM | S3 | 8 | | 9 | Replace "small letters" with "small font" | Cornelia Krug | Change implemented. |
| 107 | SPM | S3 | 13 | | | In the ii) models of the impacts of changes in direct drivers on nature …..aren't there impacts of changes in **indirect drivers** on nature.?. | Sebsebe Demissew | In keeping with the IPBES Conceptual Framework impacts of indirect drivers on nature are viewed as |

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| | | | | | | | | being mediated by their impacts on direct drivers. |
| 108 | SPM | S3 | 22 | | | ---- add options after .....a range of plausible futures as **plausible future options**... | Sebsebe Demissew | "options" is not appropriate here because, unlike policy and management options addressed by intervention scenarios, the "plausible futures" addressed by exploratory scenarios do not necessarily represent choices to be made. |
| 109 | SPM | S3 | 14 | S3 | 14 | Twice on this line, replace "biodiversity and ecosystems" with either "biodiversity, encompassing genetic, species, and ecosystem diversity" or similar, or else simply "biodiversity". | Thomas Brooks | See response to comment 95. The use of "biodiversity and ecosystems" throughout this report is based directly on the IPBES Conceptual Framework, where "biodiversity and ecosystems" are used to denote the scientific conceptualization of "nature". |
| 110 | SPM | S3 | 14 | S3 | 15 | It is important to develop models that illustrate the link between anthropogenic drivers, effects on biodiversity → ecosystem functioning → ecosystem services and consequences for human well being.<br><br>In addition comes human behaviour, e.g. when changes in ES are related to political decisions or a political setting in a country. For all this (biodiversity, ecosystem functioning, ecosystem services, human behaviour), we need state indictors models and scenarios. This is unfortunately not clear from the document. | Lene Buhl-Mortensen | If the point being made here is that models dealing with these individual links need to be better integrated, then this is now addressed explicitly in Key Finding 3.3 and Guidance Point 3. |
| 111 | SPM | S3 | 11 | S3 | 11 | "Models" should say "models for biodiversity and ecosystem services" or "models described in this assessment" as those are the types of models described in this assessment. There are many other types of models that do not fall into the three categories listed in the paragraph. | U.S. Government | Key Findings 1.1, 1.2 and 1.3 now rewritten to make it clearer that this assessment focuses on scenarios and models relating to biodiversity and ecosystem services. |
| 112 | SPM | S3 | 19 | S3 | 19 | Same comment as above for the term "scenarios" – please make it clear that you mean scenarios in this report (or scenarios for biodiversity and ecosystem services), not "scenarios" broadly. | U.S. Government | Key Findings 1.1, 1.2 and 1.3 now rewritten to make it clearer that this assessment |

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| | | | | | | | | focuses on scenarios and models relating to biodiversity and ecosystem services. |
| 113 | SPM | S3 | 19 | S3 | 28 | Section 2.1.3: Not sure what is meant by “intervention scenarios.” Does this mean a change in a federal land management plan?? Perhaps a change in relative prices of resources? | U.S. Government | “intervention scenarios” now clearly defined in Key Finding 1.2. |
| 114 | SPM | S3 | 1 | S3 | 3 | State that models can be used to help gain understanding of an existing system or to help make predictions about future states of that system | UK Government | Role of models now more clearly defined in Key Findings 1.1 and 1.3. |
| 115 | SPM | S3 | 9 | | | Add to fig SPM1 definitions of direct, indirect drivers and anthropogenic assets | UK Government | These terms now explained further through inclusion of bracketed examples, in Key Finding 1.2 and the right panel of Fig SPM.1. |
| 116 | SPM | S3 | 11 | | | Should say that models can be divided into three broad functions ( not categories- that would be type of model) | UK Government | This finding now replaced by Key Finding 1.3 and reworded. |
| 117 | SPM | S3 | 11 | S3 | 17 | Mention that models can be used to understand existing systems. Also mention the critical issue of uncertainties in modelling and the limitations of predictive power | UK Government | Uncertainties and limitations of models now addressed more explicitly in Key Findings 2.5 and 3.4, Guidance Point 4, and IPBES Guidance Point 5. |
| 118 | SPM | S3 | 12 | | 13 | ‘habitat loss’ suggests an assumed conservation perspective. ‘habitat change’ or ‘habitat conversion’ would be a more neutral term. | UK Government | Change implemented. |
| 119 | SPM | S3 | 14 | S3 | 14 | Could change ‘role’ to ‘roles’ to emphasise that there is not just one | UK Government | This no longer included in revised text. |
| 120 | SPM | S3 | 19 | S3 | 28 | Note that scenarios and models are both attempts to gain some traction on an inherently unpredictable and unknowable future. This should recognise the wide range of different sources and types of uncertainty in any assessment and the need to avoid deterministic and positivist assumptions that are often found in integrated assumptions where issues of contingency, path dependency, context and actor agency are often squeezed out, downplayed or ignored. | UK Government | Now addressed to some extent in Key Finding 1.2 – i.e. “exploratory scenarios provide an important means of dealing with high levels of unpredictability, and therefore uncertainty, inherently associated with the future trajectory of many drivers”. Also dealt with in considerable depth throughout full report. |
| 121 | SPM | S3 | 1 | | | There are 2 drivers defined as direct and indirect throughout the document. | Yi Huang | The use of “indirect” and |

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| | | | | | | Not sure if this is appropriate or continue to use the commonly used concepts of drivers, pressures. This is a more appropriate way of explanation, particularly true in policy context. The indirect drivers are more defined as those of socioeconomic and goverance elements which have much higher interests among the decision making communties. If these are defined as indirect, it might los sits "power" in policy discussion. | | "direct" drivers is based directly on the accepted IPBES Conceptual Framework. |
| 122 | SPM | S3 | 4 | S5 | 12 | The whole findings are not very clearly presented – 1) lack of a "model" between the policy making needs and scientific supports. It should be a description about the key gaps between decision making and information/knowledge ; 2) what is the status of the knowledge support tot he decision making in biodiversity and ecosystem services, and what is the potential of the developed/innovative methods/tools.3) It may be also helpful to have a point on the stakeholders' mapping in power relations and decision making process. 4) What is the key methods/tools potentially useful for IPBES' work. | Yi Huang | Not clear what changes are being suggested here. |
| 123 | SPM | S3 | 1 | S3 | 3 | Better to add "iv) between Nature's benefits to people and Good quality of life" that is also important as described in Figure SPM.3. | Ministry of the Emvironment, Japan | This fourth type of model was not included in the original scoping of this assessment, although it is encompassed to some extent in Chapter 5 of the technical report. Addition of the "cross-sectoral modelling & integration" element in Fig SPM.1 is intended to convey that comprehensive assessment of good quality of life will often require integration of modelling of the contribution of nature's benefits with other types of models (beyond those considered in this assessment) from across multiple sectors. |
| 124 | SPM | S4 | 28 | S4 | 28 | Set out need to describe, elaborate, communicate, explain and analyse implications of uncertainties | Gary Kass | The need to assess and communicate uncertainties associated with models now addressed more explicitly in Key Findings 2.5 and 3.4, Guidance Point 4, and |

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| | | | | | | | | IPBES Guidance Point 5. |
| 125 | SPM | S4 | 23 | | | The greatest barrier to generating models and scenarios is the lack of a functioning defintion for biodiversity. | Alan Feest | This assessment adopts the CBD's definition of biodiversity (included in the report's glossary). |
| 126 | SPM | S4 | Fig. SPM. 2 | | | Could be useful to write the x-y axis tittles in Fig. SPM.2 (global biodiversity loss and years, respectively). | Gunay Erpul | Change implemented. |
| 127 | SPM | S4 | 23 | Page S4 | 30 | The fact that, especially, models are highly data-dependent and lack of data could prevent using and developing scenarios and models, too, at the national and local scales. Data availability could be a serious barrier! | Gunay Erpul | Challenges and needs relating to data availability are addressed in Key Finding 3.5 and Guidance Point 5. |
| 128 | SPM | S4 | 27 | S4 | 27 | Policy-relevant. I know this is the accepted thing to say but it comes over cumbersome to policy makers. In this line "for policy-relevant problem solving" is better as "to assist policy development and implementation" | Peter Bridgewater | Change implemented. |
| 129 | SPM | S4 | | | | Figure SPM.2 presents quite a complex example, as the length of the summary paragraph shows. I am not sure that this is the best option (in terms of visual or textual interpretability) for a 'summary for policymakers.' Can a simpler example not be found – and if not, can this be sufficiently streamlined?<br><br>In fact, the version in Chapter 1 on p125 is much more interpretable. | Derek Tittensor | This figure has undergone substantial revision working in collaboration with a graphic designer. The purpose, and intended messages, of the example are now conveyed more clearly. |
| 130 | SPM | S4 | 1 | S4 | 20 | It would help to understand, why this figure SPM.2 has been given such a prominent position in the SPM. An explanation would be most useful because this figure only illustrates one aspect of SPM 2.1.3 (page S3) but not the key finding. Please also consider shortening the the description for fig. SPM 2 (line 4-20).<br>Furthermore, the labelling of the y-axis is not self explaining | Germany | See response to previous comment (129).<br><br>The y-axis has now been labeled. |
| 131 | SPM | S4 | 16 | S4 | 16 | Please add 'made' after 'significant progress has been'. | Germany | Change implemented. |
| 132 | SPM | S4 | 23 | S4 | 30 | One additional barrier is that models can become too complex and incomprehensive for users, such as for instance policy makers but also other decision makers, who are often non- experts. Therefore, we invite you to consider adding this aspect as a key finding as well with a corresponding para in the chapter . | Germany | This Key Finding has been revised with this comment in mind. This barrier is also addressed, in part, by Guidance Points 2 and 6, and IPBES Guidance Points 3, 4 and 5. |
| 133 | SPM | S4 | 5 | | 9 | Split sentence to make for easier reading, e.g. …. scenarios for 2015. These could attain….. | Cornelia Krug | Change implemented. |

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| 134 | SPM | S4 | 15 | | 18 | Split sentence to make for easier reading, e.g. …..some of the Aichi Targets. In most cases, however, progress will not be sufficient..... | Cornelia Krug | Change implemented. |
| 135 | SPM | S4 | 28 | | | Add issues to ..... Two keys to..**Two Key issues**.... | Sebsebe Demissew | This text now removed in revision. |
| 136 | SPM | S4 | 24 | S4 | 28 | Another barrier to use of models might be the currently high uncertainty of their predictions for some applications. | Axel G. Rossberg | This barrier now identified more explicitly, as point (v) under Key Finding 1.4. The need to assess and communicate uncertainties associated with models is now also addressed more explicitly in Key Findings 2.5 and 3.4, Guidance Point 4, and IPBES Guidance Point 5. |
| 137 | SPM | S4 | 1 | | | In many developing countries, Infrastructure development is unavoidable. To put forward the target as "reduce infrastructure expansion" may be seen as counter productive. It may worth to communicate the issue as "mitigate infrastructure impacts", this means better spatial planning, green buiding, energy efficiency and so forth which can better highlight the nexus (climate-biodiversity-water) | Mochamad Indrawan | This target was defined in the Rio+20 study used here as an example. These targets were not set by the current assessment, nor are they being advocated by this assessment. |
| 138 | SPM | S4 | 1 | | | In a similar vein, compare "reduce consumption and waste" with "sustanable consumption and production" | Mochamad Indrawan | As for previous comment. This target was defined in the Rio+20 study used here as an example. |
| 139 | SPM | S4 | 30 | | | It is true that dialogues must be fostered and sustained between" scientists, practitioners, and policy makers . I wonder if it would worth to put business as sub-category of practitioners. This is simply because business also drive policies, and that businesses also changes with ecological economics. For instance, the timber industry in my country is bowing to market forces by adopting system for verification of timber sources/ chain of custody, and some companies | Mochamad Indrawan | This sentence was removed during revision and restructuring of the SPM. |
| 140 | SPM | S4 | 24 | S4 | 24 | **(Chapters 2 & 7)**. These barriers include a large-scale shortage of well qualified and technically qualified people eg. Taxonomists and Subject matter specialists on biodiversity; a general lack of understanding among decision-makers about | Jamal A Khan | Not clear what change is being suggested here. The shortage of human and technical resources is already identified here and in other Key Findings and Guidance Points. |
| 141 | SPM | S4 | 25 | | | Does models and scenarios provide adequate evidence for decision | Kiruben | Not entirely clear what |

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| | | | | | | making: Most recently there has been a drive for more evidence based decision making which relies more on rapid resposes, short term evidence needs rather than longer term projections which scenarios and models provide. | Naicker | change is being suggested here, but the importance of aligning scenarios and models with the temporal scale of decision making is highlighted in Key Finding 3.2. |
| 142 | SPM | S4 | 4 | S4 | 20 | To see more clearly the benefits of using models and scenarios, it would be useful to describe/illustrate the situation faced by decission makers if they did not have these models/scenarios. I suggest adding a few lines on this. | Per Arneberg | Several reviewers have suggested that this caption is already too long and detailed. |
| 143 | SPM | S4 | 5 | S4 | 6 | A foot note with a weblink could be added to find more info on the models GLOBIO and IMAGE (if available) | Cécile Leclere | Change implemented. |
| 144 | SPM | S4 | 1 | S4 | 1 | It would be useful – in order to ease the understanding of the figure - to add a title to the right-hand panel figure, for example “the three Rio+20 exploratory scenarios to attain multiple international sustainability objectives” | Cécile Leclere | Change implemented. |
| 145 | SPM | S4 | 17 | S5 | 20 | If this is the recommendation, then there must a capacity building mechanism to ensure that there is sufficient capacity in member states and regions to develop models and integrate them into decision making. | Fundisile Mketeni | The need for such capacity building is promoted in Key Finding 3.6, Guidance Point 6 and IPBES Guidance Point 3. |
| 146 | SPM | S4 | 1 | S1 | | Figure SPM 2.2 is unclear; recommend revision so it is accessible. | U.S. Government | Figure has been revised substantially, with the help of a graphic designer, to enhance its accessibility. |
| 147 | SPM | S4 | 18 | S4 | 20 | Please delete this sentence. It’s not appropriate for a report like this, and not well substantiated. | U.S. Government | Sentence now revised to remove direct attribution of “additional commitment for action and funding” to the influence of the GBO4 report. |
| 148 | SPM | S4 | 23 | S4 | 30 | Section 2.1.4.: Other barriers would include the financial and staff resources for conducting meetings, visioning exercises, etc. | U.S. Government | Dealt with by Guidance Points 2 and 6, and IPBES Guidance Point 3. |
| 149 | SPM | S4 | 29 | S4 | 29 | “High degree of transparency” is unclear in this context. Perhaps a better phrase is “increased transparency”? It would also be useful if you identified among whom there should be transparency. Do you mean the scientists, practioners, and policy makers later in the sentence? | U.S. Government | This text removed in revision. |
| 150 | SPM | S4 | 23 | S4 | 30 | Transparency issues in modeling are an important stake for policy makers, but another important stake is the flexibility/adaptability of such models: | Ophélie Darses | Importance of carefully adapting scenarios and |

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| | | | | | | in which way all these tools could be manipulated by policy makers and how they can change some assumptions of the models. Most of the time, the interface does not allow such manipulation. I believe it could be important to mention it. | | models to the needs of policy and decision making is addressed by Key Findings 2.1, 2.2 and Guidance Point 1. |
| 151 | SPM | S4 | 18 | | | move line 18 to the end of line 5, so it reads An example of the use of scenarios and models for agenda setting in the Global Biodiversity 4 Outlook 4 (GBO4) assessment of the Convention on Biological Diversity (CBD).The GBO4 report was an important factor in prompting additional commitments for action and funding at 18 the CBD 12th Conference of the Parties | UK Government | See response to comment 147 – the attribution of "additional commitment for action and funding" to the influence of the GBO4 report has now been purposely toned down, and this sentence is therefore probably better left at the end of the caption. |
| 152 | SPM | S4 | 24 | | 30 | Another barrier is the lack of understanding among scientists of the context, framework and options available to policy makers, so that scenarios produced may lack traction. Also, there is no reference to availability of data to develop, run and validate models. | UK Government | The first of these barriers is addressed by Key Findings 2.1 and 2.2, and Guidance Points 1 and 2.<br><br>The issue of data availability is addressed by Key Finding 3.5 and Guidance Point 5. |
| 153 | SPM | S4 | 28 | | | change to Two ways to overcome these barriers are a high degree of transparency, and a sustained dialog between 29 scientists, practitioners and policy makers. | UK Government | This text removed in revision. |
| 154 | SPM | S4 | 28 | S4 | 28 | Set out need to describe, elaborate, communicate, explain and analyse implications of uncertainties | UK Government | This barrier now identified more explicitly, as point (v) under Key Finding 1.4. The need to assess and communicate uncertainties associated with models is now also addressed more explicitly in Key Findings 2.5 and 3.4, Guidance Point 4, and IPBES Guidance Point 5. |
| 155 | SPM | S4 | 4 | S4 | 20 | Better to specify which are explorative and which are policy scenarios in this specific case so that readers can make clear link between Figure SPM2 and the definition of scenario (page S2, l24-28). In this regard, Figure | Ministry of the Emvironmen | Types of scenarios employed in this study now identified more explicitly. |

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| | | | | | | SPM2 might not be a good example of explorative scenario as it provides only one baseline scenario while it demonstrates how the three policy scenarios deviate from the development pathway of baseline scenario. | t, Japan | |
| 156 | SPM | S4 | 24 | S4 | 28 | One important challenge missing in the current explanation is gap of time horizons between scenarios and policy making. While the scenario often explores the several decades of development pathways, policy making has a time frame of 5 to 10 years for planning. This gap in time horizons often prevents government officials to integrate the result of scenario analysis in their decision making. | Ministry of the Emvironmen t, Japan | Importance of aligning scenarios and models with the temporal scale of decision making is highlighted in Key Finding 3.2. |
| 157 | SPM | S5 | 17 | S5 | 17 | Insert 'with sufficient caveats' after 'should' | Gary Kass | Change implemented. |
| 158 | SPM | S5 | 22 | S5 | 22 | Insert 'and limitations' aftre 'utility' | Gary Kass | Change implemented. |
| 159 | SPM | S5 | 25 | S5 | 25 | Insert '(and limitations)' after 'use' | Gary Kass | Change implemented. |
| 160 | SPM | S5 | 17 | | 18 | 2.2.1. While we agree with the intent of this key recommendation, we are mindful of the fact that there is a sequencing problem in the delivery of some work programme deliverables. In particular we note as identified in the overview and vision chapter, that the pollination and pollination services assessment has not had the benefit of the applicaton of scenarios and models. We would strongly urge you to make a further recommendation to the taskforce on knowledge and data to consider ways in which the value can be added to the pollination assessment by judicious use of scenarios and models (for example alternative futures for a world with and without insecticides). | Geoff Hicks | The pollination assessment has already been completed, and therefore no avenue exists for adding the use of scenarios and models to that assessment. |
| 161 | SPM | S5 | 24 | | 25 | One of the key deliverable of this taskforce has to be the identification of a global scenarios and modeling "swot" team. This could the mechanism by which those experience in the use of scenarios and models can act as a taskforce to be mobilized into every IPBES deliverable to ask questions about where, when and how scenarios and models can be used in specific places and then to help do it. | Geoff Hicks | Addressed by IPBES Guidance Points 1 and 5. The 4th Plenary is also being asked to consider the proposed establishment of an ongoing expert group to perform this exact role. |
| 162 | SPM | S5 | SPM 3 | | | This is a good example except there is no ILK input, could it somehow be alluded to? | Peter Bridgewater | References to "traditional knowledge" and "local datasets and knowledge" included in figure and caption. |
| 163 | SPM | S5 | | | | As per the comment above, Figure SPM.3 also feels over-complicated – there is a lot of text in the figure itself. Can this be simplified and made more straightforward (i.e. more like Figure SPM.1)? | Derek Tittensor | Accessibility of this figure now enhanced through collaboration with graphic designer. |
| 164 | SPM | S5 | 17 | S5 | 17 | "all" – this means a strong obligation that might not be appropriate for all | Germany | This recommendation now |

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| | | | | | | IPBES deliverables | | reworked as IPBES Guidance Point 6, and the statement has been made less emphatic. |
| 165 | SPM | S5 | 22 | S5 | 22 | The term 'experts' might suggest that scientists are meant here. Because in IPBES-related activities non-academic partners play an equally crucial role, it might be helpful to clarify this point. | Germany | Clarified that experts include both scientists and non-scientists. |
| 166 | SPM | S5 | 28 | S5 | 28 | Insert the term 'often' after ‘Because of the diversity and’. Rationale for the change: Scenarios and models can take on many forms, including non-technical, intuitive types. | Germany | Change implemented. |
| 167 | SPM | S5 | 1 | S5 | 14 | Delete this table because. There is not clarity about why to introduce this graph here. It creates confusion since this chapter is still a general outline to the document and does not need to go into specifical considerations. | Diego Pacheco | Figure retained. Based on overall reviewer feedback, the case-study examples (Figs SPM.3 and SPM.4) make an important contribution to the accessibility of the SPM. |
| 168 | SPM | S5 | 20 | S5 | 20 | (at the end). However, scenarios and models should be based on the existence of different knowledge systems as referred to the in the IPBES conceptual framework, including the Indigenous and Local Knowledge Systems (ILK) and following the recommendations of the ILK rules and procedures and the Participatory Mechanism. | Diego Pacheco | This recommendation now largely rewritten, as IPBES Guidance Point 6, including explicit promotion of the role of ILK and the ILK taskforce. |
| 169 | SPM | S5 | 31 | S5 | 31 | In the development of the deliverables including scenarios, models and decision support tools, should involve considerations reflected in the ILK rules and procedures and taking into consideration the full engagement of the Participatory Mechanism. | Diego Pacheco | IPBES Guidance Point 4 now includes the following: “Due to the importance of indigenous and local knowledge to the objectives of IPBES, particular consideration should be given to mobilizing experts with experience in formulating and using scenarios and models that mobilize indigenous and local knowledge, including participatory approaches (chapter 7). Experts involved in the IPBES deliverables should work closely with the indigenous and local |

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| | | | | | | | | knowledge task force in implementing those approaches. Broader use of participatory scenario methods in work undertaken or promoted by IPBES is one potentially important pathway for improving the contribution of indigenous and local knowledge." |
| 170 | SPM | S5 | 20 | | | Provide list of examples with chapter numbers under this heading | Cornelia Krug | This would be a long list, and would require too much space. |
| 171 | SPM | S5 | 1 | S5 | 31 | **Figure SPM.3** should have a box for Nature's threat to people | Jamal A Khan | The boxes in this figure are based directly on the elements of the IPBES Conceptual Framework. |
| 172 | SPM | S5 | 17 | | | Does the explicitly include the risk elements and the assumptions | Kiruben Naicker | Not clear what change is being suggested here. |
| 173 | SPM | S5 | 1 | S5 | 12 | Figure SPM.3 is hard to understand. Again, a less condensed explanation is needed to provide the insight that can inspire decision makers. Although it is referred to chapter 1 for more details, it should be possible to read this part of the SPM as a stand-alone text for key people with little time available for reading. | Per Arneberg | Accessibility and readability of this figure now enhanced through collaboration with graphic designer. |
| 174 | SPM | S5 | 1 | S5 | 2 | A foot note with a weblink could be added to find more info on the models RIOS, InVEST and CLUE-s (if available) | Cécile Leclere | Change implemented. |
| 175 | SPM | S5 | 1 | S5 | 2 | The acronym LU/LC should be written in full letters so that anyone can understand | Cécile Leclere | Now removed from figure. |
| 176 | SPM | S5 | 28 | S5 | 31 | Ambiguous. Please clarify. Why is this recommendation inclusive of responsibilities that fall within the scope of other task forces? | Fundisile Mketeni | The Introduction now makes it clear that IPBES taskforces and expert groups form one of the audiences for the SPM, and guidance for this audience is now explicitly communicated under "Guidance for IPBES and its task forces and expert groups. |
| 177 | SPM | S5 | 1 | S5 | 1 | Was this example specifically put into the form of the IPBES conceptual framework? If so, please make that clear in the caption. | U.S. Government | Yes, and this is now made clearer in the revised figure. |
| 178 | | S5 | 2 | S5 | 2 | Figure SPM.3: Reference to InVest for an ecosystem services model. It | U.S. | The source document for |

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| | SPM | | | | | should be noted that InVest is one of several models and tends to operate at a very high geographic level. I am not sure it can be downscaled to address local conditions. | Government | this example makes it clear that InVEST was indeed employed as part of this work. |
| 179 | SPM | S5 | 7 | S5 | 9 | Figure SPM.3. Sentence reads "Models were then used….and then translate these into economic costs and benefits." It should be noted that the costs and benefits associated with ecosystem regulating and supporting services should be included in the Cost/Benefit calculation. | U.S. Government | Change implemented. |
| 180 | SPM | S5 | 17 | S5 | 17 | What if scenarios and models aren't available or appropriate for all the IPBES assessments? Recommend re-phrasing "Scenarios and models could be included, if appropriate, into the implementation plans of the IPBES deliverables. . . ." | U.S. Government | This recommendation now reworked as IPBES Guidance Point 6, and the statement has been made less emphatic. |
| 181 | SPM | S5 | 30 | S5 | 31 | The Task Force is an established body of IPBES, so it is reasonable to include them here. The expert groups, however, are not intended to last longer than the duration of the assessement, so should not be listed here as a resource for future expert groups. | U.S. Government | The inclusion of expert groups in this context has been considered by the IPBES Bureau, and no objections were raised. All on-going assessments can profit from guidance, but it is true that some groups will have started work before having this assessment available. However, the experts involved in the methodological assessment have been actively working with the regional assessments to provide advice in advance of the publication of the methodological assessment. |
| 182 | SPM | S5 | 1 | | 12 | The example is not clear for a general audience. If the aim is to show the points at which models supported decision making, the reader needs to have more specific explanations – numbering the boxes and referring to them in the figure text would be helpful. | ZuZu Gadallah | This figure has been completely revised, working in collaboration with a graphic designer, and now includes numbered boxes, along with explanatory maps and charts. |
| 183 | SPM | S5 | 28 | | 31 | "expert groups should seek guidance from this assessment" and reference | Brenda | The issue of timing for the |

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| | | | | | | to page 103 line 15-23<br>There are several areas in the assessment that point to the need for clear guidance on the use of models and scenarios for the future work of the IPBES e.g. on communication of uncertainty, standardization of terminology, data , measurement metrics etc. While proposed follow up work is mentioned in the para referenced above, it is questionable if it can be completed in time for the guidance to be used in the regional assessments. Based on the material assessed, is it not possible for the recommendation sections to include proposals to adopt existing standards where appropriate or to adopt approaches in the regional assessments that would test standards or provide opportunities to better learn about the needs specific to IPBES assessments. | McAfee | regional assessments is now addressed head-on in IPBES Guidance Point 2: "The time available for the current round of thematic and regional assessments is insufficient to allow rigorous development of new scenarios. As such, experts planning to make use of scenarios and models in these assessments should consider focusing on synthesizing results from existing applications of scenarios and models." |
| 184 | SPM | S5 | 17 | S5 | 17 | Insert 'with sufficient caveats' after 'should' | UK Government | Change implemented. |
| 185 | SPM | S5 | 17 | | 31 | These recommendations could be firmer, and would be better if they alll started with actions words- eg Intregrate models into IPBES delivery plans, embrace the use of models, build capacity. 'Should' or could is implicit in a recommendation, so I would suggest use of action words. | UK Government | All recommendations have now been re-written as "guidance points". |
| 186 | SPM | S5 | 17 | | 20 | It is not clear how the key findings are linked to this recommendation. The key findings have illustrated some applications of scenarios and models but they have not fully demonstrated 'substantial contributions' to policy making or across all functions of IPBES. The potential role of scenarios and models should be addressed within the scoping phase of assessments so that timing and budgetary issues can be considered. | UK Government | This text now removed. |
| 187 | SPM | S5 | 22 | | | change 'need to be aware of the utility' to 'accept and embrace the use of' | UK Government | Text no longer included in revision. |
| 188 | SPM | S5 | 22 | S5 | 22 | Insert 'and limitations' after 'utility' | UK Government | Change implemented. |
| 189 | SPM | S5 | 25 | S5 | 25 | Insert '(and limitations)' after 'use' | UK Government | Change implemented. |
| 190 | SPM | S5 | 15 | S5 | 20 | The first recommendation "to integrate models and scenarios into the implementation of all IPBES plan…" is not an appropriate statement. Scenarios and models are not elements of IPBES work plan, but a tools/approach with which IPBES could add value to all its work plan. Should state as "to improve IPBES's quality of work through efficient application of scenarios and models…." | Yi Huang | This distinction now accommodated in revised IPBES Guidance Point 6. |
| 191 | SPM | S5 | 22 | S5 | 31 | The second recommendation – 'be aware of…' is strong enough for | Yi Huang | These suggestions now |

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| | | | | | | IPBES to promote the scenarios and models. It should be recommended that IPBES should build up key scenarios and models pools available for the stakeholders, and keeping development of methodlogical development as one of the key themetic work of IPBES to strengthen IPBES's knowledge support to the quality decision making. | | covered by IPBES Guidance Points 1 to 6. |
| 192 | SPM | S5 | 1 | S5 | 3 | "Land-use & Climate scenarios in 2020" of the Figure SPM.3 should be moved above the rectangle box of "indirect Driver" for consistency with Figure SPM.1. | Ministry of the Emvironment, Japan | This box no longer included in revised figure. |
| 193 | SPM | S5 | 4 | S5 | 12 | This figure shows only causal diagram of different models and does not specifically show how scenarios were used in the analysis. Better to modify this figure so that readers can understand how scenarios mediate modeling and decision making. | Ministry of the Emvironment, Japan | Change implemented. |
| 187 | SPM | S6 | 19 | S6 | 19 | Mention breifly how the policy or decision-context mght be identified and characterised | Gary Kass | This text – "it is important to first identify the policy or decision context" – now removed. |
| 188 | SPM | S6 | | | | Section 2. Reword 2.2.3 slightly so that recommendation is "That IPBES continue to support capacity building in the scientific community and amongst policy and decision makers to overcome barriers to the use of scenarios and models" ... then with details on how IPBES envisages this will be done. A further sentence on how IPBES sees the idea standards/ transparency products connecting with idea of capacity building might be useful here (ie. what are the outreach activities IPBES would support). This would be useful info for policy makers on the continuing role of IPBES. | Shane Orchard | Change implemented. |
| 189 | SPM | S6 | 1 | S6 | 3 | ILK seems relegated to where appropriate rather than integrally included so the formulation can change from between to among to integrally include ILK | Spencer Thomas Spencer Thomas | Additional emphasis is now placed on the integral importance of ILK throughout the SPM, including Key Finding 2.4: "Scenarios and models can benefit from mobilization of indigenous and local knowledge because these can fill important |

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| | | | | | | | | information gaps at multiple scales, and contribute to the successful application of scenarios and models to policy design and implementation". In total "indigenous and local knowledge" is referred to 13 times within the document. |
| 190 | SPM | S6 | 9 | S6 | 13 | This text is too long for a headline. | Germany | Now halved in length. |
| 191 | SPM | S6 | 23 | S6 | 25 | One of the key findings in the report is that no single combination of scenarios and models can address all decision contexts, so a variety of approaches is needed. While this is the current state-of-the-art, is it advisable to continue to have variety of tools, fragmented and unlinked across contexts and scales? May it be conceptually indispensable to develop tools that addresses all policy and decision contexts in the future? Some initial steps in this direction are being made on the so-called "ridge-to-reef" framework where interlinkages among various ecosystems are explored. Please consider this aspect where appropriate in the report. | Germany | The need to move towards closer integration of scenarios and models across domains, spatial and temporal scales etc is addressed explicitly in Key Finding 3.3 and Guidance Point 3. |
| 192 | SPM | S6 | 26 | S6 | 31 | There is a problem with this graph. Is only devoted to understand one set of disciplines and knowledge systems under the IPBES. The ILK are ignored. Also the GBO has been criticized in the last COP11 of the CBD because only highlights issues related to the green economy and other considerations should be introduced related to ILK (Decision XII.1 COP11 Korea, paragraph 18), as follows:<br><br>"18. Requests the Subsidiary Body on Scientific, Technical and Technological Advice to review the main implications and findings of the fourth edition of the Global Biodiversity Outlook and its underlying technical reports as well as additional information from fifth national reports and other submissions with a view to identifying further opportunities and additional key actions, including, among others, the contributions of collective actions of indigenous and local communities for the achievement of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, and other actions for the targets where there has been the least progress at the global level, for consideration by the Conference of the Parties at its thirteenth meeting";<br><br>IN CONSEQUENCE, I SUGGEST to introduce in addition the following graph: | Diego Pacheco | The number of examples included in this figure has now been reduced to three, and these are all published studies (citations included). The alternative graph suggested does not include specific real-world examples, which was the original intention of this figure. |

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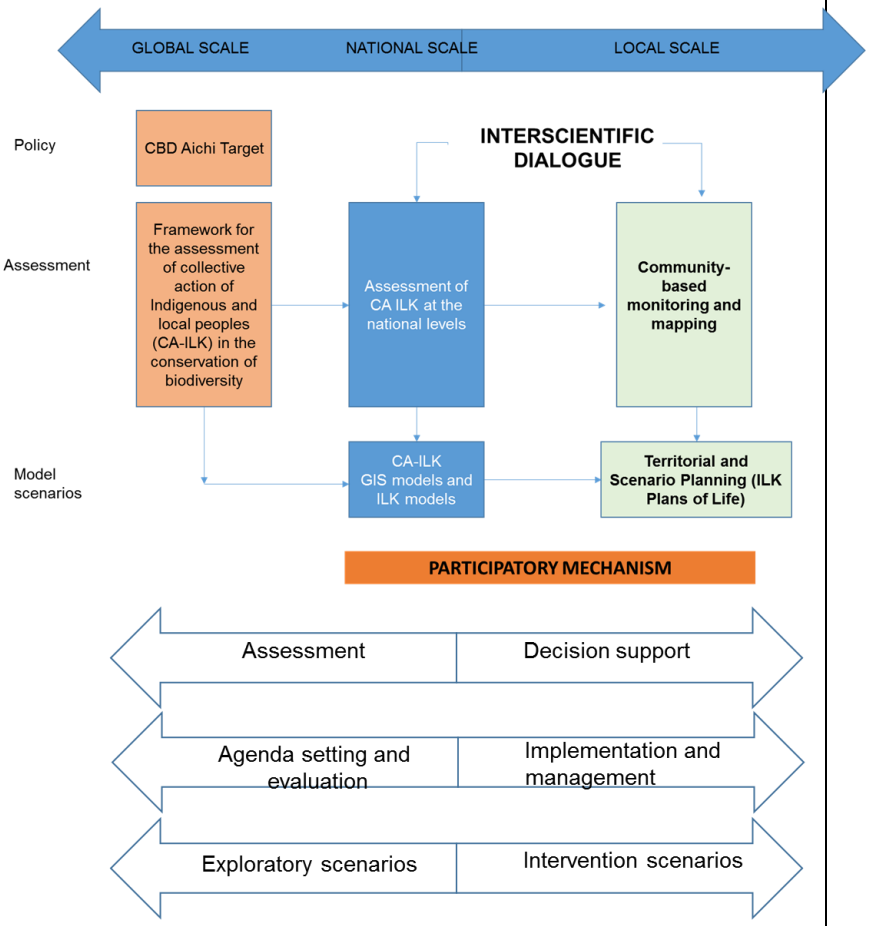
| | | | | | |  <br>Figure SPM.A4 – Examples of the use of scenarios and models in assessment, policy design and policy implement other ILK combining the international, national and local priorities and expectations. | | |
| 193 | SPM | S6 | 29 | | | Replace “This” with “The diagramme” or “the figure” | Cornelia Krug | Change implemented. |
| 194 | SPM | S6 | 30 | | | “cycle” not “cycled” | Cornelia Krug | Change implemented. |
| 195 | SPM | S6 | 1 | S6 | 6 | Recommendation 2.2.3: there is a strong and growing scientific community involved in model-based decision support research on | Olivier Thébaud | Sentence added: “This engagement should link, |

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| | | | | | | biodiversity and ecosystem services internationally. This community is organised in various fora, which could be referred to here: i.e. capacity building could also be based on the establishment of linkages with existing scientific networks involved in the development of model-based assessment and decision support research. For example, in the marine domain, ICES has several working groups that bring together researchers working in the field of integrated modelling. | | wherever possible, with relevant networks and forums already established within the scientific and practitioner communities." |
| 196 | SPM | S6 | 1 | S6 | 2 | "2.2.3. IPBES should support capacity building in the scientific community and amongst policy and 1 decision makers to overcome barriers to the use of scenarios and models…" presumably civil society as agents of change should be included as targets for capacity building? | Mochamad Indrawan | This capacity building is targeted at those developing or using scenarios and models for policy and decision making. If members of civil society are making decisions affecting nature and nature's benefits then they are covered by the term "decision makers". |
| 197 | SPM | S6 | 19 | S4 | 19 | **management (Chapter 2, Figure SPM.4)**. In order to analyse policy level impacts, it is important to first identify the policy or decision context, | Jamal A Khan | This text now removed. |
| 198 | SPM | S6 | 10 | S6 | 11 | Delete "assessment and decision-support" from this subheading. Scenarios and models should contribute to all four of IPBES functions (Page S5, lines 17-20), not just assessments and policy support. | Thomas Brooks | Change implemented. |
| 199 | SPM | S6 | 26 | S6 | 26 | I know that this isn't intentional, but the way Fig SPM.4 is developed makes it appear that GLOBIO is the only modelling approach in use at broad scales. Please balance this. It would be appropriate to add: "IUCN Red List of Threatened Species" into the centre-left box for Global/Assessment; "IUCN Red List Categories & Criteria" into the bottom-left box for Global/Models + Scenarios; "European Red List" into the centre box for Regional/Assessment; "Guidelines for Application of IUCN Red List Criteria at Regional and National Levels" into the bottom-centre box for Regional/Models + Scenarios; "South African Red List" into the centre-second-from-right box for National/Assessment; and "Guidelines for Application of IUCN Red List Criteria at Regional and National Levels" into the bottom- second-from-right box for Regional/Models + Scenarios. | Thomas Brooks | Only one example now involves GLOBIO. |
| 200 | SPM | S6 | 5 | | | Does transparency include an inclisive process of all stakeholders as well as ownership of the process? | Kiruben Naicker | Not clear what change is being suggested. |
| 201 | SPM | S6 | 11 | | | The risk elements of widespread application without proper context/national circumstances | Kiruben Naicker | Not clear what change is being suggested. |
| 202 | SPM | S6 | 26 | S6 | 34 | SPM4, We are not sure the arrows across the bottom are overly useful. E.g. Implementation and Management can happen across all scales (just | U.S. Government | Arrows now redrawn to make it clearer that, for |

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| | | | | | | one example), i.e. I don't think this is a continuum. | | example, assessment and decision-support can occur across all scales, just in differing proportions. |
| 203 | SPM | S6 | 17 | S6 | 25 | This comment does not go to the text, but to a potential omission in how you conceive/describe the first key finding. I agree completely with the contents of the paragraph. However, you make no mention of the importance of standardizing definitions of ecosystem services or of standardizing the functionality of the (ultimately) small range of tools that will be needed for different stages of ecosystem services assessment and policy determination under different decision-making environments. You may have erred on the side of embracing flexibility, to the exclusion of endorsing a conceptual framework that directs results toward a system predicated on common definitions for common ES, a system of *reproducible* combinations of models that will meet (what will emerge to be) a known set of planning and management options. Only with this type of framework that is flexible but allows for channels to ease the way, will later teams be able to better exploit the work of previous teams to streamline the effort and expense of undertaking ES assessments (and projected scenario calculations). I believe this argument is consistent with your Key Recommendation in 4.2.4 on S15, as well as a few places in Chapter 5 (at least), including p503, lines 3-4, and p515, lines 7-14.<br>While getting environmental metrics and measurements is difficult it is critical to support the later work of valuation economists. "Biodiversity" at least *exists* in a discrete way in a known space, even if it may be hard to sample. In contrast, to guess the value of ES to individuals when there cannot be purchase of ES, because no "final" ES are marketed (definition from Boyd and Banzhaf, 2007) at any price, only indirect purchases that may indicate value (hedonic estimation based on housing prices near a greenspace), or "stated preference" surveys have been possible so far. There is a vast literature arguing about techniques for valuation methodologies. All are debatable in a way that an average of transects of species counts is not.<br>Standardizing definitions, terms, and metrics is critical for setting up a databank that compiles characteristics of ES assessment attempts and results. One use for such standardization and characteristics is the way they give context for efforts at valuation of ES. One result of having in place the public good of this knowledge bank is that ES assessment teams will have fewer and fewer elements that they must develop on their own – they will become comfortable with correctly using or borrowing established *modular* pieces. The more this builds from the ecosystem side, | U.S. Government | Important point. But the issues raised here regarding standardization of definitions of ecosystem services, and valuation approaches, are being addressed by the IPBES "Methodological assessment on diverse conceptualizations of multiple values of nature and its benefits". |

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| | | | | | | the closer we will be to reaching the very high bar for "benefits transfer" which can ease the need for very expensive and time-consuming (and consequently rare) formal economic valuation efforts.<br>To summarize: keep "flexibility in approach," but forthrightly state the need for standardization of definitions, for development of modular tools, and for the need to build a databank of results that will ease the constraints of meta-analysis and the generation of robust meta-values for common flows of ES. The ARIES artificial intelligence "semantic meta-modelling" approach, the EPA's National Ecosystem Services Classification System (NESCS), and the EPA's Final Ecosystem Goods and Services Classification System (FEGS-CS) all have characteristics that can support this vision of making tools that will make ES assessments easier, cheaper, more common, and more informative to the larger body of potential ES-assessment practitioners – be they researchers, analysts, or policymakers. More such tools will prove necessary. This is the alternative to oars being pulled in the water at random times and directions. | | |
| 204 | SPM | S6 | 5 | | 7 | Further explanation is needed to link the statement on high standards of transparency with the recommendation on capacity building | Brenda McAfee | This recommendation now expanded as IPBES Guidance Point 3. |
| 205 | SPM | S6 | | 17 | 25 | **Finding 3.1.1.** the statement is applicable to all policy contexts, not just those involving nature. Perhaps refine to focus on the last statement to acknowledge that we are discussing decision contexts that follow a national policy cycle and that no single approach or set combination of methods can address all decision contexts in that. | Louise Ann Gallagher | This key finding now removed, and the last statement elevated to form Key Finding 2.2. |
| 206 | SPM | S6 | 9 | | 13 | Change to 'Methods and tools need to be matched to assessments or decision support activity. Policy and decision makers should be involved in their development and use.' | UK Government | The length of this high-level message has been reduced by 50%. |
| 207 | SPM | S6 | 19 | S6 | 19 | Mention briefly how the policy or decision-context might be identified and characterised | UK Government | This text – "it is important to first identify the policy or decision context" – now removed. |
| 208 | SPM | S6 | | S8 | | I agree with the point that models and scenarios need to be used in context. But it would be better to distinguish the differences between models and scenarios. There are some models (SDMs or evapotranspiration for example) that are fairly universally applicable to a biophysical process. In fact they are almost 'tools'. Whereas there may be no universal scenarios. While model choice needs to be made fit for analytical cojtect, scenarios always need to be part of a social process. | UK Government | Agreed. This distinction becomes more apparent throughout the technical report, but is probably too much detail for the SPM. |
| 209 | SPM | S7 | 3 | S7 | 3 | Explain what is meant by 'successful applications of scenarios and models'...or at elast flag the variety of views of what this might entail | Gary Kass | Clarified by changing to: "previous applications of scenarios and models that |

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| | | | | | | | | have contributed successfully to real policy outcomes". |
| 210 | SPM | S7 | 3 | | 6 | We agree with the notion of end user involvement in project design/transfer and indeed throughout the whole process. We must however ensure that some of the models are such that non technical end users can engage fully otherwise we will have to solely rely on scenarios as a way of facilitating effective engagement. | Geoff Hicks | Agree with sentiment – but not clear what change to the text is being suggested. |
| 211 | SPM | S7 | 18 | | 19 | This section is meant to be for policy makers and potentially decision makers at all levels of society. As it is presently written it focuses more on the role of the IPBES work programme deliverables not the wider societal use in natural capital/BES or how they might be valuably used domestically. | Geoff Hicks | The different types of audience targeted by the SPM (and the assessment as a whole) are now clearly articulated in the SPM's introduction. Findings and guidance for different audiences are also distinguished more clearly through division into "Key findings", "Guidance for science and policy" (more broadly) and "Guidance for IPBES and its task forces and expert groups". |
| 212 | SPM | S7 | 1 | S7 | 2 | including, where appropriate, holders of indigenous and local knowledge - this again is too condescending a tone – is "where appropriate" necessary? | Peter Bridgewater | "where appropriate" retained, in recognition that ILK will be of relevance to many, but not all, policy and decision-making processes. |
| 213 | SPM | S7 | 6 | S7 | 6 | Insert word "iterative" before the final word "process" | Brian Kastl | No change made in the interests of avoiding further complicating this sentence. |
| 214 | SPM | S7 | 8 | S7 | 9 | Fig. SPM 5: A direct transfer of raw data or models to the agents of the surrounding circle is not possible without some translation (e.g. flow of data to stakeholders). An intermediate circle arround data and models symbolizing "(means of) knowledge transfer" might be appropiate. | Germany | This concern at least partly addressed through inclusion of photographs of people involved in these transfers, in revised version of this figure prepared by graphic designer. |
| 215 | SPM | S7 | 19 | S7 | 19 | Is the medium-term perspective not in the scope of IPBES? | Germany | "medium term" added. |
| 216 | SPM | S7 | 22 | S7 | 22 | The statement 'will focus on tools available at local scales' should be modified. It might not be helpful if in a particular IPBES deliverable | Germany | Changed to "will focus on tools available across a |

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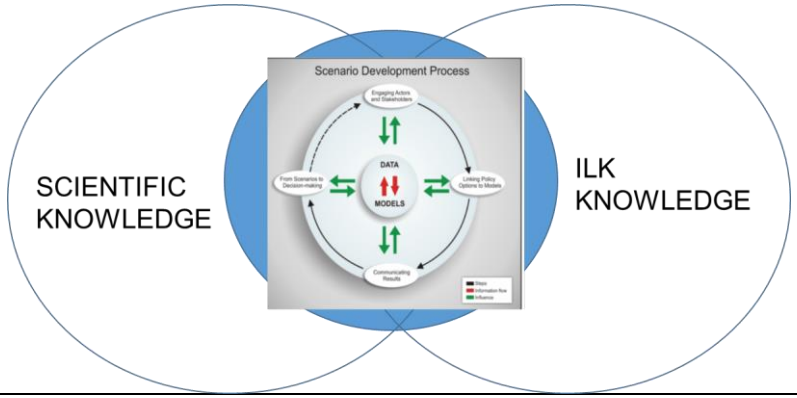
| | | | | | | restrictions are set on the scales that another deliverable focuses on. If such restrictions are put in place, they need be the result of a transparent decision-making process. | | range of scales". |
| 217 | SPM | S7 | 7 | S7 | 15 | There is the need to integrate this graph into the understanding 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:   | Diego Pacheco | This figure is not intended to convey the existence of multiple knowledge systems. As it stands it does not address any particular knowledge system, and it therefore implicitly relates to all such systems. |
| 218 | SPM | S7 | 21 | S7 | 21 | ... from local scale scenarios and models. There is also need to introduce the spedific considerations of ILK knowledge (see figure SPM 4A) , complementary and in interaction with the scientific knowledge (scenarios and models). See figura SPM 4. | Diego Pacheco | This finding – now Key Finding 2.3 - is focused purely on issues of spatial and temporal scale. ILK is considered in the following finding – Key Finding 2.4. |
| 219 | SPM | S7 | 1 | S7 | 3 | **3.2.1b states**: IPBES should also engage the scientific community, in particular through the task force on Indigenous and Local Knowledge, the task force on Knowledge, Information and Data and the expert group on Scenarios and Models to improve and more widely apply participatory scenario methods.<br><br>**SUGGESTION**: "IPBES should also engage the scientific community as well as experts or practitioners representing other knowledge systems to improve and more widely apply participatory scenario methods." | Fundisile Mketeni | Text now removed during revision. Guidance Point 1 now addresses broader community (beyond IPBES) in relation to improving, and more widely applying, participatory approaches. |
| 220 | SPM | S7 | 1 | S7 | 6 | Here, I suggest that a table titled Catalogue of Scenarios and Models should be listed under this paragraph. | Dandan Yu | Not entirely clear what change is being suggested. Figure SPM.6 and Table SPM.1 and SPM.2 list examples of scenarios and |

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| | | | | | | | | models. |
| 221 | SPM | S7 | | 1 | 6 | **Finding 3.1.2.** Even more than "relevant stakeholders", the best participatory scenarios and modelling processes are those which are developed with multiple viewpoints. The social-ecological (or human-environment system) is essentially a feedback system with a set of actors and policies that interact to constrain each other's choice sets and behaviour over time and space. This means the system (and behaviours of individual actors with this) can not be understood by looking at any one part in isolation (Bazilian et al. 2011). | Louise Ann Gallagher | Not clear what change is being suggested. |
| 222 | SPM | S7 | 3 | S7 | 3 | Explain what is meant by 'successful applications of scenarios and models'...or at least flag the variety of views of what this might entail | UK Government | Clarified by changing to: "previous applications of scenarios and models that have contributed successfully to real policy outcomes". |
| 223 | SPM | S7 | 3 | S7 | 3 | Successful needs explaining, was it because they had the made the links to policy need, useful data, understood assumptions and limitations, used appropriate scenarios and were able to influence decision making towards the desired outcome? Would this be a list of best practice from which lessons for IPBES could be drawn? | UK Government | Now clarified – "Previous applications of scenarios and models that have contributed successfully to real policy outcomes" |
| 224 | SPM | S7 | 1 | S7 | 6 | Simply refer this recommendation into a "participatory knowledge support to decision making" or similar phrases that the PMs similar with. | Yi Huang | "participatory approaches" already referred to extensively in other findings and guidance points. |
| 225 | SPM | S7 | 19 | S7 | 24 | Policy and decision making contexts and needs vary across scales. Too often, the result of the global environmental assessment is too general or too coarse for stakeholders to take concrete actions for alleviating ongoing environmental degradation. The Millennium Ecosystem Assessment (MA) tried to fill such gaps by employing multi-scale approach: while the global assessment of MA provided the global trend and state of the biodiversity, ecosystem services, and their impacts on human well-being, the Sub-Global Assessments (SGAs) tried to meet needs of local decision makers at various scales. SGAs succeeded in strengthening global findings with local reality and reinforced local findings with global data and models. We expect that IPBES assessments with its multi-scale approach can make similar contributions to decision makers. Thus, it looks better to highlight the potential of regional and sub-regional assessment of IPBES to embrace the variety of policy and decision making contexts by communicating with local stakeholders (e.g. through participatory scenario building exercise). | Ministry of the Emvironment, Japan | Not clear what change is being suggested. The general sentiment expressed here is reflected in Key Findings 2.2 and 2.3 and Guidance Points 1 and 2. |

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| 226 | 3.1.3 | S8 | 5 | S8 | 6 | Table SPM 1The “ease of use” column: differentiation between “difficult” and “expert” not clear | Werner Rolf | Now includes only “difficult”, “medium” and “easy”. |
| 227 | SPM | S8 | | S8 | | Table SPM.1: this puts a great emphasis on a few examples of ecosystem service models without any mention of the many other important types of models, e.g. those discussed in chapters 3 and 4. An explanation of the different types of model categories is needed in the SPM as this is not clear until it is explained on page 121. | Paula A Harrison | Caption now clarifies the purpose of this table, and the small number of models included, and refers the reader to Chapter 5 for description of additional models. |
| 228 | SPM | S8 | 9 | S8 | 9 | There are also descriptions of some models used in order to capture ILK in as proper way, as follows:<br><br>Table SPM.1A. Summary of the properties of several models regarding ecosystem functions in light of ILK. All models are dynamic and interactive.<br><br>Model / Ease of Use / Use in participatory process / References<br>Participatory GIS Models — Regional, watershed, landscape, local — Medium — Yes<br>Community-based participatory mapping — Easy — Yes — CBD. Community based monitoring.<br>Collective action framework — National and regional — Easy — Yes — Conceptual and methodological framework. UNEP/CBD/COP/12/INF/7 Page 2<br>System of life — National, regional, watershed, landscape, local — Yes — Pacheco, Diego. 2014<br>Plans of life — Landscape, local — Easy — Yes | Diego Pacheco | This table is intended to provide illustrative examples of major ecosystem-service models, highlighting differences in attributes, not a comprehensive list of all such models. |
| 229 | SPM | S8 | 15 | S8 | 18 | (at the end). Also, synergies and tradeoffs from scientific scenarios and models and ILK models need to be addressed and evaluate (see tables | Diego Pacheco | This finding now removed. |

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| | | | | | | SPM.1 and SPM.1Afigures above). | | |
| 230 | SPM | S8 | 1 | S8 | 6 | Table SPM.1: I am not sure how the list of models cited here was established but I believe that there might be others that could be cited. For the marine domain, Atlantis would be an obvious one: e.g. Fulton EA, Smith ADM, Smith DC, Johnson P (2014) An Integrated Approach Is Needed for Ecosystem Based Fisheries Management: Insights from Ecosystem-Level Management Strategy Evaluation. PLoS ONE 9(1): e84242. Other approaches with a fcu | Olivier Thébaud | Caption now clarifies the purpose of this table, and the small number of models included, and refers the reader to Chapter 5 for description of additional models. |
| 231 | SPM | S8 | 10 | S9 | 29 | In practice, the combination of a need for multi-criteria evaluation (point 3.1.4) and of the need to consider uncertainty (point 3.1.6) often leads to seek thresholds or "tipping points" in the different dimensions that matter to people (ecological, economic, social), which model-based approaches can assist in identifying / discussing. This has for example been the focus of a growing literature on viability analysis applied to natural resources management. | Olivier Thébaud | Not clear what change is being suggested. |
| 232 | SPM | S8 | 12 | S8 | 12 | of nature's benefits and nature's threats to people and all other organisms | Jamal A Khan | This finding now removed. |
| 233 | SPM | S8 | 5 | S8 | 5 | TESSA is applicable at the site level, not landscape level. | Thomas Brooks | ***** This is a valid point, which has not been addressed in the version of the SPM to be considered by the Plenary. If possible, this will be corrected as part of the approval process – by changing "Regional, static" against TESSA in Table SPM.2 to "Site, static".** |
| 234 | SPM | S8 | 2 | | | It would useful to express the limitations of such models. | Kiruben Naicker | The limitations of the listed models are addressed implicitly by the listed attributes – i.e. ease of use, flexibility etc. |
| 235 | SPM | S8 | 5 | S8 | 6 | Corporate ESR, SEEA-EEA and Green GDP/GDI are NOT ecosystem services models. Corporate ESR is a guidance to conduct a diagnosis of interactions between business activities and ecosystem's functionning. Results are qualitative and subjective. SEEA-EEA is an accounting framework for organising information and data on ecosystems and their services. Green GDP/GDI are indicators that complement the traditional GDP. | Cécile Leclere | No longer included in this table. |

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| | | | | | | They can be mentionned somewhere else in the summary since they are interesting approaches for policy makers but they should not appear in the Table SPM.1, it is really confusing.<br><br>Should they though my remark stay in this table, they have to appear in a different colour since those approaches are completely different from all the other models mentionned in the table. | | |
| 236 | SPM | S8 | 1 | S8 | 8 | Table SPM.1 This table is not very clear in its presentation. What is indicted in the "Ecosystem servcies "coulm? In the "ease of use" column, how does "expert" relate to the rest of the scale (easy/medium/difficult)? | David Cooper | "ecosystem services" column has been removed.<br><br>"expert" category now removed from "ease of use" column. |
| 237 | SPM | S8 | 1 | S8 | 8 | Table SPM.1 A short description of what each of the models (in column one) do would be useful. Otehrwise, what is the point to this table? It gives no information. | David Cooper | Caption now better clarifies the purpose of this table, and the small number of models included. |
| 238 | SPM | S8 | Table SPM 1 and para 3.14 | | | Paragraph 3.1.4 stresses the importance of assigning benefits to actual people, whose values for the ES will differ by person, in models and in scenarios. Almost all of the models in the table model or attempt to return results for all of the steps in an ecosytem services assessment, for a narrow range of ES. SEEA-EEA, Matrix models, and Green GDP are exceptions in range. Conceptual frameworks for helping to standardize definitions of ES or to standardize how flows of ES are characterize (as SEEA-EEA or Green GDP might) may be *modular*, i.e., may attempt to increase the breadth and precision of *one* step of ES assessment without attempting to undertake all of them. ES Classification frameworks of this type may indicate *every possible* ES for an environment, and thus prompt more quantification and valuation at other ES assessment stages. USEPA's NESCS and FEGS-CS certainly do this, and with minimal double-counting of services. CICES is designed to do at least most of this. These systems for identifying what the relevant ES for quantification and valuation are have the potential to enhance other tools and efforts. They are not mentioned here perhaps because the focus is on tools for comprehensive assessment, when most of these refer to a small handful of ES? Doesn't the goal need to be larger? For the record, NESCS appears to be the only classification system designed with the express intent of identifying all of the ES necessary to asses synergies and trade-offs, at any spatial scale. So like FEGS-CS (the only other "final" ecosytem services classification system that assigns benefits to people), NESCS exactly meets the needs described in 3.1.4,so it should qualify for inclusion in | U.S. Government | Key finding 3.1.4 now removed.<br><br>Most models referred to in this comment no longer appear in the table, and the caption now better clarifies the purpose of this table, and the small number of models included. |

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| | | | | | | Table SPM.1 along with FEGS-CS and CICIES (which at least goes to "uses" of ES if not the exact users, so may be useful at a macroeconomic – if not as useful at a microeconomic – scale)? | | |
| 239 | SPM | S8 | 1 | S8 | 7 | Table SPM.1: Suggest including several ecosystem service models that have been developed for water by the USArmy Corps of Engineers (USACE) | U.S. Government | This table is intended to provide illustrative examples of major ecosystem-service models, highlighting differences in attributes, not a comprehensive list of all such models. |
| 240 | SPM | S8 | 15 | S8 | 15 | The value of an ecosystem service is directly related to who the beneficiary is. The value is not just dependent on the decision making context. Suggest adding "and the beneficiary" after the work "context") | U.S. Government | Text no longer included in revision. |
| 241 | SPM | S8 | Table SPM. 1 | | | The authors gather very different models in a same table and I don't think it is relevant for policy makers. The first 8 models are "models" that require programmation and calculation, demanding input data and rely on many assumptions (taht are not always transparent), contrary to the last three "models" that are more conceptual. It is a very important distinction to make. | Ophélie Darses | The last three models have now been removed.<br><br>Caption now better clarifies the purpose of this table, and the small number of models included. |
| 242 | SPM | S8 | | 10 | 16 | **Finding 3.1.4** Explain why synergies and trade-offs matter. How can we make 'first best' or 'second best' allocation decisions without having information on what is lost or gained in terms of efficiency and other criteria for policy assessment from different allocation choices.<br><br>Models of ecosystem services also need to take into account the challenges in assigning values to nature's benefits to people because these values depend on the decision-making context. : the difficulties I have with this statement are 1) we should be talking about models of ecosystem services but also models and scenarios for evaluating the impacts of changes in ecosystem service delivery to outcomes for economic sectors, social targets and environmental goals; 2) we estimate real or proxy values to environmental benefits on the basis of market-based estimates, or values indicated by stated or revealed preferences. Decision-context matters in the case of stated preferences in particular, but it's not the only factor to consider, i.e. What specific value, to whom in what timeframe, compared to what baseline/endowment, measured in what unit…etc. Suggest deleting the sentence. | Louise Ann Gallagher | Text no longer included in revision. |

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| 243 | SPM | S9 | 2 | S9 | 2 | Replace ‘understand and account for’ with ‘improve understanding and explanations of’ | Gary Kass | Change implemented. |
| 244 | SPM | S9 | 21 | S9 | 29 | Notethe rnage of types of uncertainty (i.e. risk, uncertaintiy, ambiguity an dignorance – after Stirling). Reference methods by which uncertainty might be ‘communicated and dealt with effectively’ | Gary Kass | This level of detail not appropriate for the SPM. Is dealt with in the full report. |
| 245 | SPM | S9 | 4 | | 5 | Here is a major weakness of the process in that validated connections between biodiversity (often in the form of Species Richness) and ES is almost totally absent (but see Winfree et al. 2015 where population as an element of biodiversity quality is shown to be operative). So in terms of established knowledge the importance of the link (and of particularly to ES) is slight. The moral, ethical and religious context of IPBES is almost totally absent from all documents published so far except under a small heading of “cultural”!!!! | Alan Feest | Not clear what change is being suggested. |
| 246 | SPM | S9 | 10 | | 19 | Again the relative size of the boxes indicates that biodiversity is not very important . | Alan Feest | Fig SPM.1 now totally redrafted (by graphic designer), and the size of the “nature” box is equal to, or larger, than the other boxes. |
| 247 | SPM | S9 | 7 | | | Tools are under development (instead of ‘are available’) as still quite some work needs to be done here | Belgium Government | Text removed during revision. |
| 248 | SPM | S9 | SPM 6 | | | This figure has some potential confusion for Policy makers. The deconstructed box labelled Nature has genes, species and ecosystems – yet SPM1 has Biodiversity and ecosystems (itself confusing with the CBD definition). And then species are shown as an arrow to cultural services, but no arrow at all to supporting. I think this depiction is both wrong and certain to cause confusion in the minds of policy makers. I suggest reframing it, keeping in line with the CBD definition of Biodiversity. | Peter Bridgewater | This figure now removed, and replaced by new Figure SPM.8. |
| 249 | SPM | S9 | | | | I am not sure of the usefulness of Figure SPM.6 in a policy-makers summary. It seems more about technical/implementation details. Suggest removing it from here. | Derek Tittensor | This figure now removed, and replaced by new Figure SPM.8. |
| 250 | SPM | S9 | 21 | S9 | 29 | Also error propagation from linking models is mentioned in several chapters | Paula A Harrison | Good point, but probably too much detail for SPM. |
| 251 | SPM | S9 | 10 | S9 | 10 | “Governance” and “Institutions”, included as boxes under “Indirect drivers”, correspond neither to the usual understanding of indirect drivers and nor to the definition of indirect drivers in this report. We would appreciate some clarifications on this point. | Germany | In redrawn figure this element now adopts precise label from the IPBES Conceptual Framework “Institutions and governance and other indirect drivers”. |
| 252 | SPM | S9 | 10 | S9 | 19 | The conceptual framework as depicted under SPM 6 is not intuitively comprehensible. For communication purposes and in view of the target group it should be considered to adapt the visualisation of this model. | Germany | This figure now removed, and replaced by new Figure SPM.8, to improve |

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| | | | | | | | | accessibility and clarity of message. |
| 253 | SPM | S9 | 21 | S9 | 29 | For policy design and policy implementation it is necessary to be able to estimate the degree of uncertainty emerging from various "explorative scenarios" or models (see also chapter 6.5 of the 2nd draft order of D3(c). It would be helpful, if Deliverable 3(c) provides some examples, how uncertainties were dealt with in past scenarios, models, and assessments for designing policy options and policy activities. | Germany | Considered too much detail for SPM, but examples are provided in the full report. |
| 254 | SPM | S9 | 10 | S9 | 11 | Some comments than above. In the graph there is a biased reference to the conceptual framework since only the concepts of science (in green) are introduced ignoring the concepts of knowledge systems (in blue). Therefore when mentioning to Good quality of life: human well being and LIVING-WELL IN BALANCE AND HARMONY WITH MOTHER EARTH should be included; also in nature's benefits to peoples in addition to ecosystem goods and services, also NATURE'S GIFTS should be included. Finally, when mentioning Nature also biodiversity and ecosystem and concetps of MOTHER EARTH AND SYSEMS OF LIFE should be included. Otherwise, we have a biased understanding of the conceptual framework only towards science which is not the purpose of IPBES. | Diego Pacheco | This figure now removed, and replaced by new Figure SPM.8, to improve accessibility and clarity of message. Concepts of science do not appear in this new diagram. |
| 255 | SPM | S9 | 14 | | | Add "axis" after "horizontal"; eplace "Z dimension" with "time dimension" or "third axis" | Cornelia Krug | This figure now removed, and replaced by new Figure SPM.8. |
| 256 | SPM | S9 | 1 | S9 | 29 | **Figure SPM.6** should have a box for Nature's threat to people | Jamal A Khan | This figure now removed, and replaced by new Figure SPM.8. |
| 257 | SPM | S9 | 4 | S9 | 4 | Delete "ecosystem functioning", which is part of "biodiversity". | Thomas Brooks | The use of "biodiversity and ecosystems" throughout this report is based directly on the IPBES Conceptual Framework, where "biodiversity and ecosystems" are used to denote the scientific conceptualization of "nature".<br><br>Also, following the CBD definition only the variability of ecosystems is part of biodiversity, not the |

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| | | | | | | | | ecosystems themselves. |
| 258 | SPM | S9 | 10 | S9 | 10 | Fig SPM.6 is excellent – many congratulations to all involved in developing such an informative, clear, and accurate visualisation. | Thomas Brooks | Thanks, but many reviewers found this overly complex. The figure has been simplified, but the original figure remains in chapter 6 of the assessment |
| 259 | SPM | S9 | 29 | | | This point needs to resonate throughout the document as the intention is to overcome the barriers but this is a major constraint in the process | Kiruben Naicker | This barrier now identified more explicitly, as point (v) under Key Finding 1.4. The need to assess and communicate uncertainties associated with models is now also addressed more explicitly in Key Findings 2.5 and 3.4, Guidance Point 4, and IPBES Guidance Point 5. |
| 260 | SPM | S9 | 9 | S9 | 20 | Fig SPM.6, indicate, that presumably for clarity, only some of the arrows are depicted. | David Cooper | Now explained in the caption for this figure. |
| 261 | SPM | S9 | 9 | S9 | 19 | Figure SPM.6. Box on direct drivers should include population and land use change as examples. Need to note that the production functions and processes that relate Nature to Nature's benefits to people are often unknown. Direct line from the Species box under Nature leading to Cultural benefits to people is just one benefit. There are also provisioning and supporting services benefits associated with species. Line 17: Should not only mention "provisioning" services but the others as well. | U.S. Government | This figure now removed, and replaced by new Figure SPM.8. |
| 262 | SPM | S9 | 1 | S9 | 20 | Figure SPM 6. 1) It is critical to recognize that "important relationships and feedbacks between these components" may be depicted different ways, and differences in classification and modeling for the different ways may have important implications for analysis. The EPA's in-draft NESCS Report (late 2015), as the EPA's FEGS-CS report before it (2013), makes the point that the four groups under your "Nature's benefits to people" are *not* well-suited to formally identify the flows of benefits to specific users/beneficiaries of ecosystem services. "These categories overlap extensively, and the purpose is not to establish a taxonomy but rather to ensure that the analysis addresses the entire range of services" (Millennium Ecosystem Assessment (MA, 2003), *Ecosystems and human well-being: a framework for assessment*. Island press, Washington D.C. 266 pp, page 38.). Without formal and careful classification of flows of | U.S. Government | This figure now removed, and replaced by new Figure SPM.8.<br><br>This figure has however been retained in chapter 6 of the assessment. The point of the figure is not to make specific recommendations about which classifications of components should be used and is intended to be illustrative. Indeed this |

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| | | | | | | final ecosystem services, porous categories and double-counting of benefits will hamstring efforts at ES valuation and environmental accounting based on microeconomic principles. This suggests a potential failure to properly model or build realistic predictive scenarios for the straight arrow set that is left-most in the Figure. This could cascade to the rejection of PBES arguments to policymakers, whose hired economists and accountants will not back "value" estimates rife with double-counting of benefits.<br>This said, the Figure is not expressly wrong, but carries the implication that an adequate classification of flows of ecosystem services exists for the straight arrows from Nature's benefits to people to Good quality of life because one is provided by the MA (2005, the most commonly quoted version) four groups. This implication is not well supported. Thus the diagram implies a weakness that undermines realization of the objectives described in 3.1.5., especially if there is ever the intention to attempt to accurately quantify the values people place on ES (which many ES assessments attempt, or hope to attempt). The goals stated on p131 for Chapter 5 indicate you have this intention.<br>This danger will likely be realized if an "integrated assessment model" (IAM) approach is taken (page 130, section 1.3, paragraph 1 and Figure 1.6) under the assumption that transmission of ES as "Nature's benefits to people" to people's "Good quality of life" is adequately modeled by the MA (2005) four groups of benefit types. The poor separation of those ES that cyclically serve natural functions themselves ("intermediate" services) from those ES that people use or appreciate in some way ("final" services, Boyd and Banzhaf, 2007), and the crossover of some ES between MA groupings defines an inadequacy of this grouping structure for the (microeconomic analytical) needs of valuation by environmental economists and (at least some preferences) of environmental accounting experts. Thus the breakthrough MA 2005 "four groups" have the potential to undermine the usefulness of the IAM approach for any application of this approach that hopes for rigorous attempt at valuation, or results aggregable in environmental accounting frameworks. Without careful standardization of definitions of ES that encourage comprehensive but exclusive categorization (count all relevant ES, but don't double-count any) the risk of putting great effort into research that is rejected by policy makers (as it would be for double-counting benefits) rises rapidly.<br>In short: assuming your IAM framework meets the minimum needs of ES classification for all aspects of the assessment because it refers to the MA four groups may prove an Achilles heel that well-meaning framework designers rooted in the natural sciences may later regret. It is well worth | | issue is more clearly (but not as explicitly as indicated in this comment) addressed in chapter 5 of the assessment. |

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| | | | | | | taking a look at EPA's NESCS, FEGS-CS, and the active consideration of the role of these newer ES classification tools within the UN Statistics Division's work on developing an environmental accounting system (UN SEEA-EEA, up-to-the-minute progress). Attempting to build a definitional or methodological "standard" on a *non*-taxonomic categorization of ES will ultimately alienate economists, national accounting specialists, and therefore likely also policymakers, who turn to these types of analysts "for the numbers."<br>2) The three-dimensional structures and arrow configurations in Figure SPM.6 are impressive. However, there is no curved arrow from Anthropogenic assets to "Cultural" under Nature's benefits to people. This implies an omission by my reading. I believe the lack of an arrow makes the claim that no one uses anthropogenic assets (like infrastructure, motorized vehicles, documentary films, social knowledge passed by word of mouth, or the internet) to enjoy Nature's benefits. Thus the claim seems to be made that no one uses anthropogenic assets to physically or virtually move to an environment where they may experience and enjoy elements of nature that they find spiritually fulfilling. No one uses a road or car to get to a sacred forest, or to get to a zoo to feel a connection with some wild-born animals, or uses an anthropogenic asset to watch a nature documentary. | | |
| 263 | SPM | S9 | 1 | S9 | 9 | It is not only the scenarios and models of indirect drivers, direct drivers, nature and benefits that need to be better linked. We need to better characterize and understand the actual (existing) links between the drivers and outcomes for biodiversity, ecosystem functioning and benefits, in order to support the scenarios and models. The level of confidence in scenarios and models depends on this a priori knowledge. | Christine Michel | "and underpinning knowledge" added to new Guidance Point 3. |
| 264 | SPM | S9 | 21 | S9 | 29 | This section fails to articulate that scenarios themselves are and always will be uncertain – they are a tool to deal with uncertainty and enable decision-makers to consider the range of plausible futures and the implications of different choices given those futures. This section needs to convey that otherwise the intent of scenarios may be missed. | Carina Wyborn | Good point. Following sentence now added to Key Finding 1.2: "Exploratory scenarios provide an important means of dealing with high levels of unpredictability, and therefore uncertainty, inherently associated with the future trajectory of many drivers." |
| 265 | SPM | S9 | 2 | S9 | 2 | Replace 'understand and account for' with 'improve understanding and explanations of' | UK Government | Change implemented. |
| 266 | SPM | S9 | 10 | S9 | 19 | I like the diagram but it is simplified ie it is not showing all possible links. | UK | This figure now removed, |

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| | | | | | | Given this I think it would be useful to say in the figure's supporting text that it is a 'simplified diagram showing the linking of models among the six...' | Government | and replaced by new Figure SPM.8. |
| 267 | SPM | S9 | 21 | S9 | 29 | Note the range of types of uncertainty (i.e. risk, uncertainty, ambiguity an ignorance – after Stirling). Reference methods by which uncertainty might be 'communicated and dealt with effectively' | UK Government | This level of detail not appropriate for the SPM. Is dealt with in the full report. |
| 268 | SPM | S9 | | | | add 'assumptions' | UK Government | Not clear what text this comment is referring to. |
| 269 | SPM | S9 | | | | An additional barrier in the acceptance of scenarios is that salience, legitimacy and credibility is not transparently validated and communicated for policy makers, stakeholders and local communities. An additional point 3.1.7 could reflect especially on legitimacy of the scenario (not only the uncertainity!) in the policy-making context. Legitimacy is an important concept that could also be included in later chapters of the book (e.g. chapter 7). | Melanie Paschke | Good point. Partly addressed by Key Findings 1.4, 2.1 and 3.6, and Guidance Points 2 and 6. |
| 270 | SPM | S10 | 31 | S10 | 32 | Insert 'types and' before 'sources'; insert 'effectively explain and' before 'communicate' | Gary Kass | This text now replaced. |
| 271 | SPM | S10 | 34 | S10 | 34 | Insert 'and understanding the implications of' before 'uncertainty'. | Gary Kass | This particular text removed during revision. |
| 272 | SPM | S10 | 40 | S10 | 40 | Include something about the need to ensure that any assessemnt fo uncertainty and what represnets 'appropriate' methods is dependent on the decision-context and offer some guidance as to how to diagnose the decision-context and identify what is fit-for-purpose. | Gary Kass | This recommendation now replaced by IPBES Guidance Point 5. |
| 273 | SPM | S10 | 12 | S10 | 16 | compare scenarios and models at multiple spatial and temporal scales is nessary, but may increase the complexity, outcomes from different scales maybe cannot be compared. | Fu Bin | This text now removed. |
| 274 | SPM | S10 | 34 | | | Add '*practical*' guidelines (as often such guidelines are quite vague) | Belgium Government | Change implemented. |
| 275 | SPM | S10 | 4 | S10 | 5 | Providing an environment that enables regular dialogue between scientists and other stakeholders throughout the development (and possibly also the initial application) phase of scenarios and models is excellent. Could you specifiy the format of such dialogues? It could be that the implementation of a web-based dialogue may be more practical than physical joint meetings that include policy makers and practioners? | Germany | Guidance Point 2 suggests wider use of participatory approaches to achieve this goal. More detailed suggestions are provided in Chapters 2, 7 and 8. |
| 276 | SPM | S10 | 6 | S10 | 6 | Can many scientists be engaged through the task force on ILK? It seems a bit odd that this group is mentioned first in the ILK context. | Germany | This text now removed following revision. |
| 277 | SPM | S10 | 8 | S10 | 10 | Which IPCC mechanism is being referred to? Kindly varify/provide further details about this statement. 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 scenarios (see Item 5 and Annex 4 in the Report of the | Germany | Text now replaced in revision. |

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| | | | | | | IPCC's 25th session http://www.ipcc.ch/meetings/session25/final-report.pdf).<br>The IPCC has not taken any decision since the beginning of the Fifth Assessment cycle on the development or the application of a process regarding the choice or development of scenarios or models. Instead, the IPCC currently benefits from independent work carried out by the scientific community, for example activities within the community on the "Shared Socio-Economic Pathways (SSPs)" or "Coupled Model Intercomparison Project (CMIP5)".<br>Further information can be found at http://sedac.ipcc-data.org/ddc/ar5_scenario_process/ipcc_scenarios.html | | |
| 278 | SPM | S10 | 15 | S10 | 16 | We suggest to cut the last part of the sentence, because it states the obvious. | Germany | Text removed during revision. |
| 279 | SPM | S10 | 29 | S10 | 29 | We suggest to cut the last part of the sentence. The information is redundant. | Germany | Text removed during revision. |
| 280 | SPM | S10 | 31 | S10 | 40 | It would be useful, if examples from previous initiatives are provided, which show, how uncertainties have been dealt with in the past. | Germany | Considered too much detail for SPM, but examples are provided in the full report. |
| 281 | SPM | S10 | 39 | S10 | 39 | The links between model complexity, precision and generality are likely to be unfamiliar to many people who will have to work with models and/or their in IPBES contexts. The links should be explained in words and visualized in a figure. | Germany | This text now removed. |
| 282 | SPM | S10 | 1 | S10 | 40 | The key recommendations in section 3.2 should also contain a message about the importance of knowledge transfer between stakeholders, policy makers and experts with regard to models and scenarios and about ways to further develop this area. | Germany | Covered, in part, by Guidance Points 2 and 6, and IPBES Guidance Point 3. |
| 283 | SPM | S10 | 41 | S10 | 41 | 3.2.6. Experts in IPBES Assessments will need to evaluate and compare scenarios and models from science and those from indigenous and local knowledge (ILK models), according to the appropriate social, cultural, and economic setting. There will also be the need to integrate interscientific dialogue among different scenarios and models considering the use of the IPBES ILK rules and procedures and the instrument of the Participatory Mechanism. | Diego Pacheco | This general need now addressed within IPBES Guidance Point 4: "Due to the importance of indigenous and local knowledge to the objectives of IPBES, particular consideration should be given to mobilizing experts with experience in formulating and using scenarios and models that mobilize indigenous and local knowledge, including participatory approaches. |

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| | | | | | | | | Experts involved in the IPBES deliverables should work closely with the indigenous and local knowledge task force in implementing those approaches. Broader use of participatory scenario methods in work undertaken or promoted by IPBES is one potentially important pathway for improving the contribution of indigenous and local knowledge." |
| 284 | SPM | S10 | 5 | | | Add "and other stakeholders, where appropriate" after "practitioners" | Cornelia Krug | Text removed during revision. |
| 285 | SPM | S10 | 5 | | 8 | Restructure sentence, e.g.<br>To encourage the improvemeent and and wide application participatory scenario methods, IPBES should engage with the scientific community, in particular through the task force on ILK, the task force on KID and the expert group on Scenarios and Models | Cornelia Krug | Now rewritten. |
| 286 | SPM | S10 | 28 | | | Consider replacing "experts should benefit" with "experts should receive advice and guidance" | Cornelia Krug | Text removed during revision. |
| 287 | SPM | S10 | 16 | S10 | 16 | and Models and also Subject-matter specialists on each type of biodiversity for scrutinizing the biological data, otherwise mechanical analysis may sometimes give very inconsistent results/outcome. | Jamal A Khan | Reference to "Expert Group on Scenarios and Models" now removed, at request of IPBES Bureau. |
| 288 | SPM | S10 | 9 | | | What are the necessary safeguards considered to prevent this from becoming too politicised as with IPCC | Kiruben Naicker | This particular reference to IPCC mechanisms now removed. |
| 289 | SPM | S10 | 34 | | | Certain statements about models and scenarios above on its value proposition should link these uncertainty elements | Kiruben Naicker | Not clear what change is being suggested. |
| 290 | SPM | S10 | 31 | S10 | 40 | Regarding the importance of "how to communicate uncertainty"- the IPBES task force metioned, could be asked to consider whether it is possible to use the same terminology as IPCC (cf. IPPC and use of confidence and likelihood levels). As IPBES and IPCC in their SPMs are reaching out to at least to some extent the same audience, a common language would ease understanding. | Linda Dalen | IPBES has already adopted a standard terminology for communicating uncertainty, based partly on that developed by the IPCC. |
| 291 | SPM | S10 | 19 | S10 | 19 | "agenda-setting, policy, panning, management" the typology is not consistent across different parts of the chapter | David Cooper | Text removed during revision. |

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| 292 | SPM | S10 | 3 | S10 | 4 | This recommendation needs some rewording. IPBES should create an environment where managers and scientists jointly identify priorities as part of the IPBES assessment process. IPBES would not do this independent of a working group occurring. | U.S. Government | Text removed during revision. |
| 293 | SPM | S10 | 12 | | 29 | 3.2.2, 3.2.3 and 3.2.4 all boil down to consulting experts in scenarios and modelling. These should be consolidated. | ZuZu Gadallah | This consolidation has effectively occurred during restructuring of recommendations as "Guidance for Science and Policy" and "Guidance for IPBES and its task forces and expert groups". |
| 294 | SPM | S10 | 3 | S10 | 9 | Not clear what "practitioners" mean here. It is important to include, together with the models/scenarios developers, the observationalists/experimentalists that provide the observational basis and linkages for input to models/scenarios. The dialogue required for developing and applying models/scenarios that are meaningful in terms of policy, and that are scientifically-valid, needs to expand from a top-down only approach. The scientific community already recognizes the importance of bringing together observationalists who "procure" the data and modelers to discuss best practices to meet modeling needs with current/new knowledge (e.g. Gordon Research Conference on Polar Marine Science 2013; SCOR Working Group -Biogeochemical Exchange Processes at the Sea-Ice Interfaces) . The same applies at the policy-science interface level. | Christine Michel | Meaning of "practitioners" now made clearer throughout SPM by referring more specifically to "policy practitioners", "decision-making practitioners" etc. |
| 295 | SPM | S10 | 1 | | 40 | As for 2.2, 3.2 is about recommendations,and would be better with action words, perhaps Line 2 should say IPBES experts should: and then bullet out the other points as actions for example line3 should say Facilitated dialogue… lines in all of this section should start with action words. | UK Government | All recommendations have now been re-written as "guidance points". |
| 296 | SPM | S10 | 12 | | | should say 'Evaluate and compare... | UK Government | Text replaced during revision. |
| 297 | SPM | S10 | 31 | S10 | 32 | Insert 'types and' before 'sources'; insert 'effectively explain and' before 'communicate' | UK Government | Now addressed in Guidance 6. |
| 298 | SPM | S10 | 34 | S10 | 34 | Insert 'and understanding the implications of' before 'uncertainty'. | UK Government | This particular text removed during revision. |
| 299 | SPM | S10 | 36 | S10 | 36 | The word 'in' is missing between 'uncertainty' and 'its' | UK Government | Text removed during revision. |
| 300 | SPM | S10 | 40 | 10 | 40 | Include something about the need to ensure that any assessment of uncertainty and what represents 'appropriate' methods is dependent on the decision-context and offer some guidance as to how to diagnose the decision-context and identify what is fit-for-purpose. | UK Government | This recommendation now replaced by IPBES Guidance Point 5. |

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| 301 | 4.1.1 | S11 | 21 | | | Global Biodiversity Information Facility can be written fully in front of abbreviation GBIF | Werner Rolf | Change implemented. |
| 302 | SPM | S11 | 19 | | | The caption could benefit from rephrasing/extension, as it is not entirely clear what is shown | Belgium Government | Caption thoroughly revised. |
| 303 | SPM | S11 | 3 | S11 | 4 | Same as above or maybe a definition of stakeholder might be useful | Spencer Thomas | Not clear what text this is referring to. Page or line numbers might be wrong? |
| 304 | SPM | S11 | 7 | S11 | 12 | In this para the regional biases in coverage of biodiversity studies and monitoring are highlighted. It is important to identify the reasons for these biases, e.g. lack of local experts, lack of financial support. This information will be useful for recommending the focus of capacity building, scientific research and project funding. An initial assessment on the reasons for biases will be useful for the regional assessments and task force on capacity building as well. If reasons couldn't be explored at this stage, some recommendations on how other IPBES assessments will have to deal with this issue would be very useful. (see also chapter 8, page 801, lines 11-17) | Germany | This is covered in Chapter 8 (referred to in Guidance Point 5), and is considered too much detail for the SPM. |
| 305 | SPM | S11 | 21 | | 22 | Split sentence. …. GBIF record in purple. The intensity of the colour….. | Cornelia Krug | Change implemented. |
| 306 | SPM | S11 | 7 | S11 | 12 | In the context of species-related data, the problem is not only the overall taxonomic bias (e.g. vertebrates vs invertebrates) but also the lack of taxonomic expertise (the "taxonomic impediment", compare https://www.cbd.int/gti/problem.shtml). Many of the increasingly accessible datasets from natural history collections (e.g. via GBIF) include up to 20% and more misidentifications. If the only problem is synonymy, this might be handled by standard lists. However, in many cases, the specimens are really misidentified and/or represent species that still have to be described and named – this can only be handled by taxonomic specialists. Thus, you might add an additional sentence at the end of this paragraph: "Additionally, the basic inventorying and the taxonomy of many groups of organisms is still incomplete, resulting in an continuing need for taxonomic specialists for these groups." | Jens Mutke | Considered too much detail for the SPM. |
| 307 | SPM | S11 | 9 | S11 | 9 | Replace "change" with "services data". | Thomas Brooks | Change implemented. |
| 308 | SPM | S11 | 21 | S11 | 21 | The acronym GBIF should be written in full letters so that anyone can understand | Cécile Leclere | Change implemented. |
| 309 | SPM | S11 | 7 | S11 | 12 | "significant barriers remain to data sharing" this point should be reflected in bold headline | David Cooper | Change implemented. |
| 310 | SPM | S11 | 14 | S11 | 24 | Nice figure, is there also a way to add something similar with Ecosystem Services? | U.S. Government | Changes are not readily made, and not without |

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| | | | | | | | | further complicating this figure. One of the two existing panels has already been removed to simplify the message. |
| 311 | SPM | S11 | 21 | S11 | 21 | Please define GBIF at first use (or in an acronym list at the beginning of the whole assessment.) | U.S. Government | Change implemented. |
| 312 | SPM | S11 | 7 | S11 | 12 | Yes, there are large data gaps and this is especially true for the Arctic: the map presented does not even include the Arctic. This data gap for the Arctic should be specifically mentioned and it would be important to present a map with Arctic coverage. The potential argument that the Arctic was excluded due to lack of data would be irrelevant here as the point made is about data availability. Also, concluding the paragraph with "but significant barriers remain to data sharing" suggests that this is the foremost barrier. While data sharing is a very important aspect, without data in the first place, there certainly is nothing to share or input into scenarios/models. | Christine Michel | Guidance Point 5 now emphasizes the need to fill gaps in both "data collection and provision" and the need for both "collection of and access to data". |
| 313 | SPM | S11 | | | | The figure SPM7needs a legend. It is not clear that lighter colours reflect more intense monitoring, GBIF has not been defined at this point | Michael Bordt | Change implemented, including revision of colours, and inclusion of legend. |
| 314 | SPM | S11 | 11 | | | This implies that gaps can be filled if data are shared. Gaps from non-existent data are much much larger. This section fails to address what to do if existing knowledge is inadequate to support modelling to a sufficient degree of certainty. | ZuZu Gadallah | Now addressed in Key Finding 3.5. |
| 315 | SPM | S11 | | SS14 | | With regard to data there should be a distinction made between 'data availability' and 'data accessibility'; especially because of the investment needed to remedy either of these hindrances. | UK Government | Guidance Point 5 now emphasizes the need to fill gaps in both "data collection and provision" and the need for both "collection of and access to data". |
| 316 | SPM | S12 | 20 | S12 | 20 | Again the word integration is used with respect to ILK – this is an inappropriate word for ILK involvement and needs to be rephrased, as per earlier remark. This is not a trivial issue for ILK. | Peter Bridgewater | With respect to ILK "integrate" now replaced by "mobilize", and "integration" by "mobilization", throughout SPM. |
| 317 | SPM | S12 | 4 | S12 | 5 | I agree online access to data and tools/models is important, but this needs to be closely coupled with training and guidance to avoid mis-use or mis-interpretation of model outcomes. | Paula A Harrison | The need for training and guidance emphasized in Guidance Point 6 and IPBES Guidance Points 3 and 5. |

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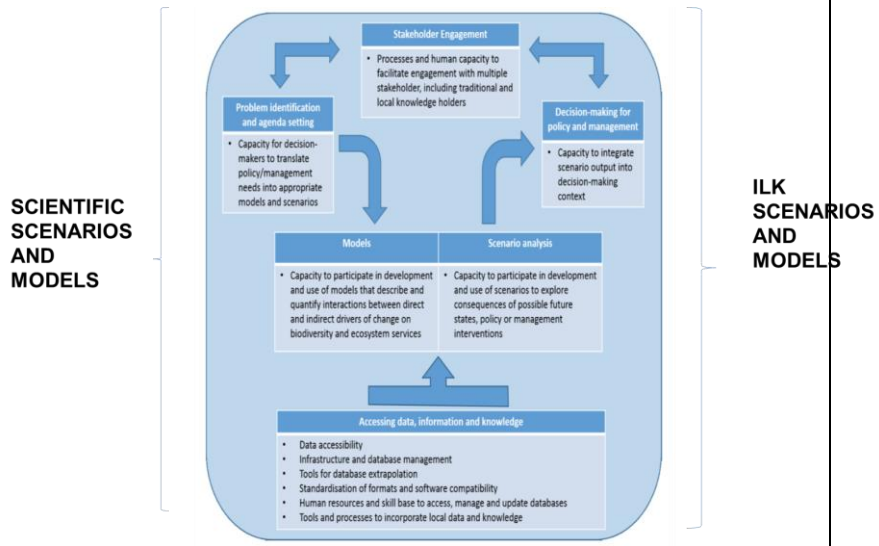
| 318 | SPM | S12 | 6 | 12 | 9 | Fig SPM 8, upper left box: “capacity for decision makers to translate...”: It seems inappropriate for decision makers to translate their needs into models and scenarios. Please consider rephrasing of this statement, possibly deletion of “for decision makers”. | Germany | Reference to decision makers in this box removed, and diagram converted to table (Table SPM.3). |
| 319 | SPM | S12 | 15 | 12 | 18 | How can ILK strengthen “traditional knowledge”? It seems that ILK is included in “traditional knowledge”. Please reconsider statement. | Germany | Text removed during revision. |
| 320 | SPM | S12 | 7 | S12 | 8 | Replace this graph by the following, in order to capture in a more balanced way the different knowledge systems:   | Diego Pacheco | This figure now converted to a table (Table SPM.3). |
| 321 | SPM | S12 | 18 | S12 | 19 | The issue here is not one of the integration of ILK into the modeling but one of the recognition of the ILK models. Therefore, the working should be as follows: There are numerous examples of ILK scenarios and modeling (see Table SPM.1A) that can be applied in different contexts. Also, integration of ILK into some scenarios and modeling (see table SPM 1A) could be possible in the context of the interscientific dialogue. | Diego Pacheco | Key Finding 2.4 now expands the original statement as follows: “There are numerous examples of successful mobilization of indigenous and local knowledge for scenario analysis and modelling, including scenarios and models based primarily on that knowledge source.” |
| 322 | SPM | S12 | 23 | | | “accessible language” | Cornelia Krug | Text removed during revision. |
| 323 | SPM | S12 | 1 | S12 | 5 | The rapidly increasing accessibility of data via the internet is an important | Jens Mutke | Considered too much detail |

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| | | | | | | step forward – but raises questions of quality control! As stated above, many biodiversity databases include significant amounts of misidentified species. Modellers should be encouraged to involve specialists for the organism group studied for quality control in the modelling process. | | for the SPM. |
| 324 | SPM | S12 | Fig. 8 | | | The capacity building requirements include as well capacity and training for data providers and data curators like field ecologists, taxonomist etc. | Jens Mutke | Considered too much detail for the SPM. |
| 325 | SPM | S12 | 18 | S12 | 19 | "…There are numerous examples of 18 successful integration of Indigenous and Local Knowledge (ILK) into scenarios and modeling;…". Can a few academic references be provided? | Mochamad Indrawan | Examples are included in Chapter 7, to which the reader is referred within Key Finding 2.4. |
| 326 | SPM | S12 | 3 | S12 | 3 | and policy makers in the use of scenarios and models, and timely updating of database from local, national, regional and global levels for improving access to data and user-friendly | Jamal A Khan | Considered too much detail for the SPM. |
| 327 | SPM | S12 | | | | Figure SPM8. The figure seems to relate only to quantitative descriptions and data. What about qualitative descriptions? | Marie Stenseke | This figure now converted into a table (Table SPM3) and worded to be inclusive of both quantitative and qualitative descriptions, although these terms are not used explicitly. |
| 328 | SPM | S12 | 10 | | | Necessary capacity building on risk management and development of appropriate safeguards is advised | Kiruben Naicker | Good point – but considered as already encompassed implicitly by existing content – e.g. "capacity to integrate outputs from scenario analysis and modelling into decision making". |
| 329 | SPM | S12 | 18 | | | Possible links to the private sector and how indigenous knowledge systems can be communication or mainstreamed effectively need to be considered | Kiruben Naicker | Considered too much detail for SPM. |
| 330 | SPM | S12 | 15 | S12 | 23 | Chapter 4.1.3. In addition to ILK, it is important to also consider traditional marine resource management, with the best available monitoring and stock assesments models, even single-species models. There is a need for bridging traditional management with the ecosystem approach. A relevant example for Europe: Fisheries management through the advices from ICES are in many ways already based on acceptance of the need for holistic ecosystem evaluations, but this work is not clearly been connected to ecosystem service concept. Even if the terminology is not the same, the need for pulling together the best available modelling tools should be reckognised, when adressing current gaps in modelling methods. | Gro I.van der Meeren | Considered too much detail for SPM. |

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| 331 | SPM | S12 | 20 | S12 | 23 | Knowledge verification. In the list of efforts that are needed to improve integration of ILK the issue of knowledge verification should be included. I could not find mention in the SPM, nor in Chapter 7, sub chapter 7.4.3, page 724-728, of the work of the MEP and Bureau, in collaboration with the IPBES task force on Indigenous and Local Knowledge, to develop draft procedures and approaches for working with different knowledge systems as requested by the IPBES-1 and IPBES-2. Such procedures should include suggestions for knowledge verification of ILK. | Nina Vik | Considered too much detail to mention explicitly in the SPM. But IPBES Guidance Point 4 emphasises the need to directly involve, and seek guidance from, the ILK taskforce, when implementing scenarios and models in other IPBES activities. |
| 332 | SPM | S12 | 1 | S12 | 5 | Is the assumption made here that scientists and policy makers will engage all other stakeholders and thus contribute to capacity development for use of models and scenario development? | Fundisile Mketeni | Yes. |
| 333 | SPM | S12 | 15 | 12 | 23 | The reference to inclusion of indigenous and local knowledge is very important. One requirement will be to develop trust and collaboration with local peoples. Not going to get there automatically. | U.S. Government | Agreed. This message now further strengthened within Key Finding 2.4. |
| 334 | SPM | S12 | 6 | S12 | 12 | Figure SPM 8 Generally to the intention of the content in the bottom box, below the blue upward-facing arrow in the figure: without standardiztion of definitions of ES, and of the characteristics metrics and measures associated with them, what will be the nature of the database you propose to use for “extrapolation”? Without this standardization the database will be a catch-all through which meta-analytic dragnetting can occur by highly sophisticated academic specialists. How will this serve to disseminate use of the IPBES conceptual framework? With standardization (see comment for S6 17-25), the database may become a bank of results whose “savings” are in common currencies from which researchers may “draw interest” using less meta-analytical complexity, with its compounded uncertainty and variability. Such a database would enjoy much more traffic. | U.S. Government | This figure now replaced by Table SPM3, within which addressing the questions posed here would require addition of too much detail for the SPM. |
| 335 | SPM | S12 | 15 | S12 | 23 | Although ILK should be considered into scenarios and models, there is no tangible, concrete ways. Thus, I suggest that references should all be shown at the end of the sentence “There are numerous examples of successful integration of Indigenous and Local Knowledge (ILK) into scenarios and modeling; however, substantial efforts are needed to broaden the involvement of ILK.” | Dandan Yu | Examples are included in Chapter 7, to which the reader is referred from within Key Finding 2.4. |
| 336 | SPM | S12 | 1 | | 12 | Missing from this list and from figure SPM.8 is data – not just access to data, but existence of data of adequate quality. (ILK may fill some gaps, but it includes information of value to local people, and may not include the particular information of interest to modellers). Below the "accessing data" box in fig SPM8 should be another box, "data." Issue is better addressed in recommendation 4.2.1 | ZuZu Gadallah | The focus of this figure (now converted to Table SPM.3) is on capacity building for development and use of scenarios and models. Guidance Point 5 in the final SPM focuses on the |

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| | | | | | | The capacity to build datasets should mention monitoring/observation and the ability to interpret observed values to generate the parameter estimates needed for models (eg reflectance measured by satellite to standing biomass). | | need to fill gaps in both "data collection and provision" and the need for both "collection of and access to data". |
| 337 | SPM | S12 | 5 | | | Should say 'can support capacity building. ( remove 'key' | UK Government | Change implemented. |
| 338 | SPM | S13 | 32 | | 33 | Ahaa a link between the two conventions (at last!) but note that in many parts of thw world the main threat to BES is from pollution (especially nitrogen) and habaitat loss. | Alan Feest | Not clear what change, if any, is being suggested. |
| 339 | SPM | S13 | 7 | | 33 | This box on IPCC scenarios is interesting but not really relevant in this part of the text. Consider relocation. | Geoff Hicks | Box co-located with Key Finding 3.1 dealing with limitations of existing global scenarios for addressing IPBES needs. |
| 340 | SPM | S13 | 43 | S13 | 49 | Key finding 4.1.6. only mentions the comparison of model results to independent data as a way to communicate the uncertainty of model / scenario outcome. While this might be correct from a purely scientific point of view, in reality these data are not always (rarely) available. The uncertainty of model outcome may also be communicated through less quantitative measures (e.g. uncertainty approach of UK NEA, MA, IPCC). These less quantitative approaches should also be mentioned as a way to evaluate uncertainty. | Belgium Government | This broader perspective, including use of model-model inter-comparisons, now covered in Guidance Point 4. In addition IPBES has adopted IPCC-like uncertainty language that can be used for assessment of scenarios and models. |
| 341 | SPM | S13 | 39 | | 40 | ..social, *economic* and ecological components | Belgium Government | Text removed during revision. |
| 342 | SPM | S13 | 37 | S13 | 37 | "Links between biodiversity and ecosystem services" - this is another area where care is needed in use of language, and perhaps more explanation about what the perceived gaps are. | Peter Bridgewater | Some more explanation now provided in Guidance Point 3. |
| 343 | SPM | S13 | | S13 | | Box SPM.1: IPCC TGICA (Technical Group on Scenarios for Climate and Impact Assessment) is currently producing a new report on "Use of scenario data for climate impact and adaptation assessment. They are only just producing the zero-order draft, but it might be useful to refer to this as something that the expert groups should be aware of being published in 2016. | Paula A Harrison | Close collaboration between IPCC and IPBES is already encouraged at the end of this Box. The TGICA report is not yet available, and therefore cannot be cited here. |
| 344 | SPM | S13 | 25 | S13 | 25 | Kindly provide information, which IPCC scenarios are being referred to here? (see also comment on SPM 3.2.1, S10, line 8 to S10, line 10) | Germany | This is referring to all currently available IPCC scenarios, as described in the previous paragraph, to which citation of a relevant |

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| | | | | | | | | publication has now been added. |
| 345 | SPM | S13 | 35 | S13 | 36 | Beyond indicating that important gaps exits in the availability of models, for the purpose of avoiding duplication of efforts, it may be useful to indicate that the development of new models/scenarios should take stock of what tools are already available at the required geographic scale(s). | Germany | Key Finding 3.3 and Guidance Point 3 address the need to fill gaps in availability of models across relevant spatial scales. |
| 346 | SPM | S13 | 36 | S13 | 36 | Ecosystem FUNCTIONS and services | Diego Pacheco | Text removed during revision. |
| 347 | SPM | S13 | 3 | | | Add "," after goals | Cornelia Krug | This sentence now removed. |
| 348 | SPM | S13 | 7 | | | Instead of "IPBES scenarios" rather use "Scenarios used in IPCC assessments" | Cornelia Krug | Retained "IPBES scenarios" to make it clear that these scenarios would be developed expressly to serve the needs of IPBES, rather than adopted from other processes. |
| 349 | SPM | S13 | 1 | SPM | 5 | The nature of the scenarios that are being referred to here is unclear: are these explorative or policy and intervention scenarios? | Olivier Thébaud | Now completely rewritten. |
| 350 | SPM | S13 | 43 | S13 | 49 | You might be overselling complex numerical models here: critical evaluations of model uncertainty of the kind you are asking for are occasionally done, and then the result is often that uncertainty is high. So there actually is evidence that current model uncertainty is high for some kinds of applications. Yet, model outputs can represent the best available knowledge even in these cases. It might be a task for future work to score current model uncertainty by type of application. | Axel G. Rossberg | Guidance Point 4 now better accommodates this broader perspective. Also, uncertainty now addressed in more balanced manner throughout SPM – i.e. both as a challenge and an opportunity. For example, following sentence now added to Key Finding 1.2: "Exploratory scenarios provide an important means of dealing with high levels of unpredictability, and therefore uncertainty, inherently associated with the future trajectory of many drivers." |
| 351 | SPM | S13 | 39 | S12 | 40 | "…(iv) coupling of, and feedbacks between, social and ecological 39 components…", should not this include economic drivers | Mochamad Indrawan | Text replaced during revision. |
| 352 | SPM | S13 | 25 | S13 | 33 | It has to be recognized that IPBES includes socio-cultural aspects and | Marie | This difference also |

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| | | | | | | therefore includes a broader range of social science knowledge than IPCC. Therefore, there are limits to how much can be learnt from IPCC. | Stenseke | recognized in IPBES Guidance Point 1. |
| 353 | SPM | S13 | 35 | S13 | 41 | Chapter 8 expresses implicitly shortcomings in including social science and research on socio-cultural aspects in modelling and scenario methodology for biodiversity and ES (se comments below). 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. | Marie Stenseke | Addressed in part by promotion of integrated system-level approaches in Guidance Point 3. |
| 354 | SPM | S13 | 7 | | | IPCC senarios are steeped in doom and gloom messages incorfporating disaster events. With IPBES, a distinct opportunity exists to link scenarios with the benefits of nature through a value proposition perspective | Kiruben Naicker | Not clear what change, if any, is being suggested here. |
| 355 | SPM | S13 | 17 | S13 | 23 | (Box SPM.1) point out however that unlike the SRES the RCPs are not really a true family of scennrios in that they have not been constructed in consistent ways, but instead are simply examples drawn from the much larger range fo available scenarios. (Note that in the iPCC reports, the term "RCP X.X" is used sometimes to refer to a scenario that achieves X.X W/m2, and sometimes to refer to the specifc mix of actions (pathways) for getting there). | David Cooper | Indeed, the relationship between the RCPs and the SSPs is complex, and it is very difficult to convey this complexity in an SPM. But we have slightly reworded this and added a more recent reference to the RCP / SSP process. |
| 356 | SPM | S13 | 25 | S13 | 33 | (Box SPM.1) what about developing scenarios in the context of the SDG framework. The Roads from Rio Scenarios and derivate in GBO4 are a step in this direction aiming to simultaneously achieve a range of proxies for the SDGs | David Cooper | This is certainly possible and probably desirable, but this box is a short factual description of what is happening currently in the SSP process and efforts that would be needed to create scenarios that are better adapted to IPBES objectives. Figure SPM.3 illustrates the point about the Road to Rio scenarios, so it is not clear that this needs to referenced again here. |
| 357 | SPM | S13 | 35 | S13 | 36 | "wide range o appraches" can we give some examples in the paragraph | David Cooper | A large number of examples are included in the full report, to which the reader is referred. |
| 358 | SPM | S13 | 43 | S13 | 49 | can we explain the dfferent types of uncertainty and its origins? Perhaps exaplin better Fig SPM.8. What is "communication uncertainty" in that | David Cooper | Figure now removed. |

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| | | | | | | figure? | | |
| 359 | SPM | S13 | 3 | S13 | 3 | Why sustainable development goals? Why not just goals generally? (Not everything listed in the rest of the sentence is a "sustainable development goal"). Better to keep broad, rather than specific. | U.S. Government | Text now rewritten. |
| 360 | SPM | S13 | 46 | | 48 | Uncertainty for a particular model/scenario may not be estimable with existing information. Broad categories of uncertainty, for example based on performance of model in similar systems, may still be possible. | ZuZu Gadallah | This broader perspective, including use of model-model inter-comparisons, now covered in Guidance Point 4. |
| 361 | SPM | S13 | 1 | | 2 | Remove "other deliverables" or provide explanation /examples | Brenda McAfee | "Other deliverables" removed. |
| 362 | SPM | S13 | 1 | S13 | 4 | Scenarios need to include not only projections which are good for biodiversity / human well-being but also other drivers including 'business as usual' 'high global trade in natural products eg food' and 'technological approaches' e.g. those that assume man can find a technological fix to a problem and deplete natural resources. Whilst this is picked up in other chapter it is important to include it in the summary for policy makers too. | UK Government | These are all types of "exploratory scenarios", defined and introduced in Key Finding 1.2. |
| 363 | SPM | S13 | 38 | | | 'early warning systems' ? I think of these as man-made constructs and the term does not seem appropriate here. Are you trying to say that we do not know the thresholds, or indicators of imminent collapse? | UK Government | Text now rewritten. |
| 364 | SPM | S14 | 19 | | | A major first step for IPBES is to establish a basic criterion for sampling and bring an end to sampling by walking about in favor of structured random sampling generating biodiversity indices for statistical assessment. | Alan Feest | Considered too much detail for SPM. |
| 365 | SPM | S14 | 21 | | 31 | This is the most useful recommendation for policy makers but again any up skilling must recognise the country specific or community specific requirements rather than expect or require complex modelling to be the ultimate goal. Simple models will go a long way to improving the transparency and comparability of every day decisions. | Geoff Hicks | Addressed across Guidance Points 2 and 6, and IPBES Guidance Point 3. |
| 366 | 4.2.1 | S14 | 11 | S14 | 11 | At this point maybe it could be mentioned to take Citizen Science approaches into consideration as well (?) – compare Page 808 Line 9/10 | Werner Rolf | Recommendation 5 now includes: "research, observation (including citizen science) and indicator communities" |
| 367 | SPM | S14 | 22 | | 22 | Complete the sentence by '…also support the development of human and technical capacity for scenario development and modelling, and *better understanding of its use*" | Belgium Government | Text now replaced. |
| 368 | SPM | S14 | 27 | | 27 | Complete the sentence by: … decision makers, *including on the specificity of uncertainties linked to various scenarios and modeling.* | Belgium Government | Text now replaced. |
| 369 | SPM | S14 | SPM 8 | | | This is a useful diagram, but could the role of Adaptive management somehow be represented here? | Peter Bridgewater | This figure now removed, to address general concern that |

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| | | | | | | | | the SPM, and report in general, includes too many conceptual/flow diagrams. |
| 370 | SPM | S14 | S12 | S14 | S12 | The term 'observation and indicator communities' probably doesn't exist. We'd suggest to look for different wording. | Germany | No other reviewers have questioned the use of these terms. But now modified to "research, observation (including citizen science) and indicator communities" in Guidance Point 5. |
| 371 | SPM | S14 | 11 | S14 | 19 | Even though this falls mainly in the area of the task force on Knowledge, Information and Data, the modelling community should actively ask for support and appropriate reward systems for data providers and specialists for quality control such as curators, field ecologists, and taxonomists. These are still highly needed especially for many of the most biological diverse ecosystems and groups of organisms.<br>Possible wording:<br>[in line 14 after "data collection"]: ", quality control, "<br>[in line 16 after "…development and testing"]: ", and depend on specialist who ensure the quality of the input data" | Jens Mutke | Considered too much detail for SPM. |
| 372 | SPM | S14 | 24 | | 31 | CSOs as agent of change with substantial advocacy should be included among the target groups for training and dissemination of knowledge (which otherswise pertain to scientists and decision makers) | Mochamad Indrawan | Considered too much detail for SPM. |
| 373 | SPM | S14 | 29 | S14 | 29 | thorough documentation of scenarios and models, as well as user guides; and iv) encouraging and ensuring the | Jamal A Khan | Not clear what change is being suggested here. |
| 374 | SPM | S14 | 21 | S14 | 31 | This bullet point can preferably also make a link to the report on conceptualisation on values, since scenarios and response options will likely require some assessment of values. | Marie Stenseke | Reference to IPBES task forces and expert groups removed, because this recommendation now placed under "Guidance for science and policy" (i.e. a broader audience). |
| 375 | SPM | S14 | 9 | | | Case in point about the value of key findings and key recommendations need revisiting the use of this terminology. | Kiruben Naicker | Not clear what change is being suggested here. |
| 376 | SPM | S14 | 14 | S14 | 15 | The point regarding "this will coincide with efforts to improve data collection and access to data for quantifying status and trends" is an important point that should be highlighted | Lene Buhl-Mortensen | Already highlighted by inclusion in a guidance point. |
| 377 | SPM | S14 | 12 | S14 | 13 | IPBES is not supposed to generate new data; it is inappropriate for it to work to "fill gaps" in data collection and provision. Please delete everything after "well-documented data sources" This whole recommendation should be about facilitating others to generate. | U.S. Government | Now addressed under "Guidance for Science and Policy" (broader audience), not for IPBES, so there is |

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| | | | | | | | | not implication that IPBES should directly be undertaking this work. |
| 378 | SPM | S14 | 7 | S13 | 33 | There is a key difference between IPBES and IPCC, which relates back to the point about indirect drivers. For climate change there is a clear direct driver (GHG emissions) and so easy to link to this from various socioeconomic activities. But for IPBES there are a whole range of interacting direct drivers with complex cross scale feedbacks that do not have clear pressure-response relationships to biodiversity and ecosystems. So while working back to major changes in society/ governance and decision-making will work for both, I strongly doubt that the IPCC approach is a good model for IPBES. | UK Government | Agreed, but this message is conveyed clearly in the box and the general conclusion that a broad range of scenarios and modeling approaches will be needed to meet IPBES needs. |
| 379 | SPM | S14 | 11 | | 31 | as for 2.2 and 3.2, 4.2 is about recommendations, and would be better with lines starting with action words | UK Government | All recommendations now recast as guidance points. |
| 380 | SPM | S14 | 21 | S14 | 31 | Is it sensible to treat scenario development and modelling as linked activities so strongly? To me these need different kinds of skills and capacity building, and while there are suites of resources available for both, they are not the same. Later on these are better distinguished from one another. | UK Government | These are now better separated in Table SPM.3. |
| 381 | SPM | S15 | 25 | S15 | 25 | Insert ‘and handling’ after ‘evaluation’ | Gary Kass | Text now replaced. |
| 382 | SPM | S15 | 28 | S15 | 28 | Insert ‘and improving capacity after ‘studying’ | Gary Kass | Text now replaced. |
| 383 | SPM | S15 | 30 | S15 | 30 | The task force on capacity bulding has a role here too | Gary Kass | Text now replaced. |
| 384 | SPM | S15 | 10 | | 16 | Reiterate the issues associated with sequencings and a common set of models and scenarios refer above general comment. Further we need a fast track for development and use of scenarios otherwise some assessments e.g. will loose the value add of including scenarios. We would also highlight that for Ilk and TK holders, scenarios are likely to be more compatable with the way they express BES via myths and legends, spiritual practices and story telling. | Geoff Hicks | The various issues raised here are addressed in IPBES Guidance Point 1 (for common set of scenarios), IPBES Guidance Point 2 (for fast-track use of scenarios in current assessments), and Key Finding 2.4 (for ILK). |
| 385 | SPM | S15 | 10 | | End | IPBES should not only cooperate with the scientific community on these topics but also with policymakers (and probably other stakeholders) to indicate the needs. Such information will be crucial to build the models and adjust outreach. | Belgium Government | Agreed. It is assumed that IPBES would consult widely with policymakers and stakeholders in formulating the precise needs to be addressed by the scientific community. |
| 386 | SPM | S15 | 1 | S15 | 8 | Again ILK is talked of in terms of “incorporation”. The last sentence (lines 6-8) does offer a useful way forward however. | Peter Bridgewater | Now more appropriately addressed, under Guidance Point 4: “Due to the importance of indigenous |

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| | | | | | | | | and local knowledge to the objectives of IPBES, particular consideration should be given to mobilizing experts with experience in formulating and using scenarios and models that mobilize indigenous and local knowledge, including participatory approaches. Experts involved in the IPBES deliverables should work closely with the indigenous and local knowledge task force in implementing those approaches. Broader use of participatory scenario methods in work undertaken or promoted by IPBES is one potentially important pathway for improving the contribution of indigenous and local knowledge." |
| 387 | SPM | S15 | 10 | S15 | 25 | Might be useful for definition of scientific community | Spencer Thomas | "scientific community" is regarded as reasonably self-explanatory. No other reviewers have expressed concern regarding use of this term. |
| 388 | SPM | S15 | 2 | S15 | 3 | The wording concerning 'experts', 'expert groups' and 'task forces' should be simplified. | Germany | Change implemented. |
| 389 | SPM | S15 | 18 | S15 | 23 | Please consider that not only the scientific community should be integrated in identifying gaps in modelling and building scenarios but also policy makers and other stakeholders. | Germany | This recommendation now reformulated as Guidance Point 3. Emphasis is on role of scientific community in addressing (i.e. filling) gaps, not in identifying gaps. |
| 390 | SPM | S15 | 20 | 12 | 23 | Please add "quality assurance". | Germany | Quality assurance is dealt with in Guidance Point 4 |

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| | | | | | | | | and IPBES Guidance Point 5. |
| 391 | SPM | S15 | 32 | S15 | 32 | 4.2.7 IPBES should work closely with the ILK Participatory Mechanism in order to engage effectively to indigenous and local people in the process of development of scenarios and models in order to refine the understanding of the interactions between different componentes of the conceptual framework of the IPBES, including the interscientific dialogue between the scientific community and all knowledge systems. | Diego Pacheco | Aspects of this now addressed in IPBES Guidance Point 4: "Due to the importance of indigenous and local knowledge to the objectives of IPBES, particular consideration should be given to mobilizing experts with experience in formulating and using scenarios and models that mobilize indigenous and local knowledge, including participatory approaches. Experts involved in the IPBES deliverables should work closely with the indigenous and local knowledge task force in implementing those approaches. Broader use of participatory scenario methods in work undertaken or promoted by IPBES is one potentially important pathway for improving the contribution of indigenous and local knowledge." |
| 392 | SPM | S15 | 6 | S15 | 6 | interacting with authenticated and well recognized ILK holders, otherwise the whole effort may lead to a wasteful exercise due to false or partial knowledge of ILK holders. | Jamal A Khan | Agreed – see response to preceding comment. |
| 393 | SPM | S15 | 18 | S15 | 23 | The expert group on conceptualisation of values (3d) should also be included here, in order to strengthen the economic and socio-cultural aspects. | Marie Stenseke | Reference to IPBES task forces and expert groups removed, because this recommendation now placed under "Guidance for science and policy" (i.e. a broader audience). |

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| 394 | SPM | S15 | 18 | S15 | 19 | In many cases, particularly in marine areas, it is the lack of data that is the main challenge. First we need data, then need to consider existing relationships and lastly develop good models | Lene Buhl-Mortensen | Lack of data addressed in Guidance Point 5. |
| 395 | SPM | S15 | 10 | S15 | 16 | See point above. How about idea of developing "SDG" scenarios. | David Cooper | A good suggestion, but is not something that IPBES could instigate alone without involvement of other relevant sectors. |
| 396 | SPM | S15 | 18 | S15 | 23 | Replace the words “work closely with” with “encourage the”. IPBES can encourage the scientific community to take up the work but not actually lead on it. | U.S. Government | Text now replaced. |
| 397 | SPM | S15 | 25 | S15 | 30 | Replace the words “engage with” with “encourage the”. Again, IPBES should encourage the science community to take this on, but not do the work themselves. | U.S. Government | Text now replaced. |
| 398 | SPM | S15 | 10 | S15 | 11 | The idea is good. However, it is better to have a clear explanation for following issues: who is going to do this work? Whether some people or organizations are doing this work? How to interact with existing models with a suite of scenarios at multiple scales? | Dandan Yu | Important questions that would need to be pursued if the general idea is accepted. The idea is now articulated in more depth in IPBES Guidance Point 1. |
| 399 | SPM | S15 | 25 | S15 | 25 | Insert ‘and handling’ after ‘evaluation’ | UK Government | Text now replaced. |
| 400 | SPM | S15 | 28 | S15 | 28 | Insert ‘and improving capacity after ‘studying’ | UK Government | Text now replaced. |
| 401 | SPM | S15 | 30 | S15 | 30 | The task force on capacity building has a role here too | UK Government | Reference to IPBES task forces and expert groups removed, because this recommendation now placed under “Guidance for science and policy” (i.e. a broader audience). |
| 402 | SPM | S15 | 35 |  | 41 | needs rewording to reflect other chapters | UK Government | Text now replaced. |