Dear Tina,

Thank you for the first order draft.

We believe that the regional ECA assessment generally has a comprehensive and scientifically sound structure: Status as well as trends are shown. It is however a first order draft and therefore, we hope that our comments will be useful for the second order draft of this important assessment.

The concept that incorporation of ILK is recommended in the sections so far allows to address the question of indigenous and local people as a component of socio-ecological systems where humans and nature interact, where societies are complex, and it is culturally and historically embedded. However, incorporation of ILK as an actual source of knowledge about biodiversity and ecosystems changes has not been fully developed in the FOD yet; although it is presented as a recommendation and announced in the 1st submission deadline limited this task.

The way incorporation of ILK is recommended in the sections so far allows to address the question of indigenous and local people as a component of socio-ecological systems where humans and nature interact, where societies are complex, and it is culturally and historically embedded. However, incorporation of ILK as an actual source of knowledge about biodiversity and ecosystems changes has not been fully developed in the FOD yet; although it is presented as a recommendation and announced in the 1st submission deadline limited this task.

The ECA assessment is based fundamentally on the IPBES conceptual framework. The conceptual framework refers to biodiversity and ecosystems in the ‘natural’ basis. According to the ECA authors, the review has the conceptual framework and assessment methodology which has been based on the IPBES framework.

We have identified several issues which we hope can be addressed in the final version of the assessment.

1. **Confidence language**
   - A comprehensive list of acronyms should be included.
   - Confidence language has been included for all key findings. However, there are different traditions in using confidence language in different countries. It is by taking these traditions into account in the FOD assessment can communicate the extent to which there is agreement among experts as well as the breadth of views.

2. **Scientificaciety**
   - Parrotta & Agnoletti 2007. (p1-2) “The holders and users of traditional knowledge in many parts of the world face significant challenges - continuing encroachment and/or expropriation of their lands, degradation of their forests, and traditional values. In many developed societies, technological development, the abandonment of marginal lands, reforestation, and agricultural policies are rapidly eroding cultural values and contributing to the globalisation of landscapes, which are leading to simplified ecosystems often existing in isolation or even extinction.”

3. **Definitions and acronyms**
   - Definitions of terms should be provided throughout the report.
   - New knowledge and applications should be used, if available. Some cited publications e.g. about ILK (see above) should be updated.

4. **Consistency across chapters**
   - Consistency across chapters has been verified. Some chapters and sections have changed their names and format.

5. **Use of terms**
   - The use of terms to describe the sub-regions has been checked across the chapters. The chapters will be reviewed for the use of terms to describe the sub-regions.

6. **Literature review**
   - Literature review is still ongoing. We assume the coherence and consistency of chapters will be dealt with in the next draft and haven’t provided specific comments on this.

7. **References**
   - Acknowledgement of the reviewers for providing the web links for these.

8. **Conclusion**
   - The ECA authors have been encouraged to use EEA reports as resources, and we are very glad to find that the reviewers for providing the web links for these.

9. **General**
   - General: our ‘light’ review has focused on relevant information hosted by the European Environment Agency (EEA) for which we believe a consultation by authors could improve the ECA report. We have provided some specific comments to ensure we are pointing the reviewers that this has not been done properly given the high number of EEA references in the FOD document. Information on IPBES’ terminology is included in the FOD. We could not find any use of ‘IPBES’ terminology in the FOD, which was shared with the ECA Task Force 1st submission.

We are very much grateful to the authors for all their hard work in producing this FOD.

Thank you.

Yours sincerely,

[Names]
Chapter 5


To what extent have scenarios towards a steady state economy or even degrowth been included in the analysis of possible socioeconomic pathways? For a discussion (and references) of these approaches, see Daly, H., Townsend, K., 1996. Valuing the Earth. The Role of the Ecological and Economic Sciences in Sustainable Development. MIT Press, Cambridge, MA. Elgar Pub, Cheltenham, UK; Northampton, MA.


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Thank you. The pathways section includes a lot of potential policy implications, which could be considered as a way to achieve a more sustainable future. We use the same definitions as chapter 4, which can easily relate to this section.

Thank you for pointing out this interesting paper. We have made considerable effort to reduce methodological and add more on results and activity policy throughout the text. All the tables on different types of models in section 5.5 have been deleted or moved to other chapters. Long tables in sections 4.3 and 5.4 have been inserted into the appendix.

Thank you. This is a key finding of the overall results of the chapter, it is based on a holistic and critical understanding of the findings. The statement needs to be clarified and the actual expert opinion of the different elements should be improved in order to allow the reader to better understand the significance of the findings.

Thank you. There has been a lot of conceptual work going in on IPBES in the last few years, with a number of conclusions, which have been produced in the field. The report is now available throughout the chapter. We have also included a section on the pathways in the pathways section. We have also included the study, which could include BA to highlight the very important values.

Thank you for your comment. Based on your and other comments, we have now revised the material on bioeconomy and decided to shorten it to a box. Therefore we will not include it as key finding. In section 5.9 for further information). In this box the connection between bioeconomy and the SDGs is now present. However, the information provided is often more a schematic quantification of elements identified in the studies. The schematic parts could be shortened and the actual expert opinion of the different findings have been included.

Thank you. The pathways section ends now with potential policy implications, which could be considered as a way to achieve a more sustainable future. We use the same definitions as chapter 4, which can easily relate to this section.

Thank you. We have made considerable effort to reduce methodological and add more on results and activity policy throughout the text. All the tables on different types of models in section 5.5 have been deleted or moved to other chapters. Long tables in sections 4.3 and 5.4 have been inserted into the appendix.

Thank you very much for this question. Land Use, Land-Use Change and Forestry is present. However, we did not consider this paper here, also because we were asked to follow the IPBES conceptual framework.

Thank you for pointing out this very important gap. We have made a considerable effort to reduce methodological and add more on results and activity policy throughout the text. All the tables on different types of models in section 5.5 have been deleted or moved to other chapters. Long tables in sections 4.3 and 5.4 have been inserted into the appendix.

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Thank you for pointing out this very interesting paper. Since conceptual discussions are mostly part of the pathways section, this finding has been completely removed. The revised conclusion of the study of the visions on the SDGs has been emphasized in key findings and the approaches used in the construction of the visions are discussed in the vision section and in the pathways section. We have also included the study, which could include BA to highlight the very important values.

Thank you for your comment. For your comment. The sustainability framing is now introduced and justified in more detail in the pathways section. Further the introduction has been revised to make the definition of visions clear, as well as the conceptualization of values. Also as a result of the revised definition in the pathways section, the discussion of visions can now focus on bioeconomy.

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Thank you very much for pointing out this very interesting paper. We have checked this very interesting paper. Finally, it did not include it, as it did not provide enough information for a full review. We have included a number of chapters from this paper in the summary and accordingly in the summary one needs to give an overview of case studies demonstrating the scales and geographic distribution of case studies for generating understanding and knowledge using models and scenarios. These are usually very useful to see some connections.

Thank you. The pathways section ends now with potential policy implications, which could be considered as a way to achieve a more sustainable future. We use the same definitions as chapter 4, which can easily relate to this section.

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Thank you for your comment. The formulation was misguiding and has been rephrased.

Thank you very much. Indeed our LDR expert in Chapter 5 wrote this section.

Notably, however, place-based assessments tend to be small-scale in nature, thus having limitations in their applicability for knowledge-generation toward a larger-scale assessment as this one (- as elaborated in line 251 or 248: "Notably, however, place-based assessments tend to be small-scale in nature, thus having limitations in their applicability for knowledge-generation toward a larger-scale assessment as this one."

Here we deviate from IPBES (2016) and broaden the definitions”. Please explain this deviation. Does this have implications for the global assessments? Please ensure consistency across the regional assessments.

The 5 reviews need to be mentioned earlier, yet it is not clear what is included in the chapter and why. Further justification of the aim and scope of this chapter, and what it contains or not, is needed still.

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We refer to Del 3c for how scenarios and modelling (Del 3c). The concept of archetypes is defined and introduced at the beginning of this chapter.

"We acknowledge and confirm a wide range of material of integrated assessments and links between biodiversity, ecosystem services and human well-being in this paper (also relevant for models, chapter 5.3) - this additional work should be covered if possible - to further support further according work.

Thank you for your comment. The introduction has been rewritten and considerably shortened.

Thank you for your comment. The table has been revised and considerably shortened.

Thank you for your comment. We have considerably shortened the introductory text now and focus more on chapter specific issues not tackled in Chapter 1.

Thank you for your comment. We have included certain things, as this is part of the scoping report, in order to be short and interesting for a wider audience.

Thank you for your comment. The introduction has been rewritten and considerably shortened.

Thank you for your comment. The introduction has been rewritten and considerably shortened.

This is a gap to note is on the prevalence of papers addressing climate-change adaptations as a driver or land-use changes and their consequences in terms of biodiversity and feedbacks on humans. In addition, there needs to be a search for the integrated review because it did not match the criteria selected (including more than one direct reference).

It is critical to define what we mean integrated assessments, and differentiate different types of them. They can do in a participatory way, by modelling, or through multi-disciplinary collaborative projects. By introducing the types of assessments in this chapter, the text would become clearer and newer concepts added and input more easily.

The need for integrating the types of assessments is crucial for understanding the functioning of SESs.

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suggestions to add the following an an RDP in Chap. 5.2.2.5. eg. An RDP is for intradivi
tional analysis. If it is felt another classification is better adapted to this chapter, this should be explained

***Scenarios & Model assessment classifications. If it is felt another classification is better adapted to this chapter, this should be explained***

Wood, water, pastures – restricted by the governmental regulation on nature conservation in our villages?”. “Ultimately conservation is about people. If you don’t have sustainable development around these (wildlife) parks, then

Residents in Azerbaijan and Georgia, for example, feel that their local situation is not given enough attention. As one villager put it, “Much is done in [the capital cities] Tbilisi and Baku, but what about natural resources use of

Management and zoning of LPA can be a tool for conflict mitigation in regions like South Caucasus with so called “Frozen conflicts”. (see

locals; Reconcile scientific biodiversity and species knowledge with public participation and local knowledge. Example is the recent strategy of establishing “Advisory boards” on national level (institutionalized in the so-called

Europe, Caucasus and Central Asia. Examples of adapted participatory tools out of CDE’s project experience: Transect walks together with local experts bringing in traditional knowledge on biodiversity conservation, assessing the

people. This could be participatory use of non-timber products following locally defined and sustainable regulations. On the basis of this later could be created local products and labelling of these for local population. This means

to insufficient compensation and subsidies system and regulations for development of remote and mountain regions, first measure to be recommended is on-site cooperation and participation to generate local income for the

stakeholder groups are recommended to research in detail – as in parallel to the data collection about biodiversity conservation and protection of rare species for the LPA’s. To create income alternative cooperations and participations with the local population is in around Large Protected Areas (LPA) is crucial. At detailed analysis of current local conditions on biodiversity conservation and management of LPA must also take into account existing

as socio-ecological parameters, ways of life, public security and religions, which are crucially understanding the current transition period. On the national policy level compensation subsidies for not using restricted use of peasant land is around protected areas must be on priority for governmental regulations and/or implementing for development instruments concerning the new in member states of Central and

eg. Poland, Slovakia, Romania and Bulgaria with large rural and mountain regions as hotspots of biodiversity conservation. This will be a challenge and testing process. Risk is that LPA not is used if not possible due to insufficient compensation and subsidies system and regulations for development of remote and mountain regions, first measure to be recommended is on-site cooperation and participations to generate local income for the people. This could be participatory use of non-timber products following locally defined and sustainable regulations. But on the basis of this later could be created local products and labelling of these for local population. This means

hunting, collecting non-timber products, wood and any other kind of bioenergy resources - Insufficient regulation  of water extraction – “Bottled water” and threats to aquatic biodiversity; - Eastern organizational and societal

Administrations and regional planning experts from a long-term established partner and experts network in the regions mentioned above. Key questions and challenges: As recent key questions for biodiversity conservation in

This analysis is introduced in a context active in development cooperation and biodiversity conservation in Eastern Europe, the Caucasus and Central Asia. Our perception and recommendation are clearly focused on the transition context of the former planning scenarios making use of the more than 20 years of experience and the examples that these things? (In short: will it be possible to create a democratization of natural resource use towards locally based natural resource and landscape governance? Main challenges: Severe threats by poverty for local people and in around large protection areas “in transition” – Privatization, change in landscape and insufficent regulatory basis within management and zoning plans of LPA – Fishing, trophy hunting, collecting non-timber products, wood and any other local resource use - Insufficient regulator and water extraction – “Bottled water” and threats to aquatic biodiversity – Eastern organizational and societal

Scenarios combining land use change, natural resource use, invasive alien species and pollution in terms of “land degradation” could be found! For example, Impact of Soil Degradation: A Global Scenario (ISRIC)

The GEC scenarios introduced here are not an important role in Chap. 5.2.1.4 and 5.2.2. However, short introduction on these GEC scenarios themselves as a reference is lacking

The model typologies sections is very problematic: this was one of the most difficult issues to resolve in the GCM & Model Scenario. There are ten or classifications and it would be helpful if this was consistent with the GCM & Model Assessment classifications, if not a further classification be adopted to this chapter, this should be explained

Thank you very much for pointing out this gap. When included some scenarios instead of the majority consisting of the combinations of drivers do not provide driver qualifications and rather say in scenarios on “high-low” in the case of scenario pairs, the very many studies involve a small number of drivers (e.g., baseline model) and focus on a specific issue. The scenario framework (SO4) does not provide explicit qualifications of the drivers for this to be explained

Thank you very much for highlighting this important topic. Indeed, all of these studies are that are used now and well-established in the literature. To some extent all take an integrated approach, certainly more specifically stated at combining outcomes (more socio-economic) and quantifies outcomes (more environmental).

Thank you for your comment. Apart from integrating the IIA work more deeply within the chapter in general, we would like to stress that we cannot always have co-benefits included in the progress of the scenarios presented but we can also have co-benefits embedded in the pathways of the scenarios. I do understand your point and we will reflect on this in the next round of reviews, including references, which we will cite. Thank you!

This is very useful information. Please also add other sub-regions (Central Asia, Eastern Europe) to this call.

Valuable material. We would be most grateful if you could include this comment again in the next round of review, including references, which we will cite. Thank you!

If you don’t have sustainable development around these (wildlife) parks, then

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This section has been removed as other comments asked to reduce repetition and the Chapters are cited where needed instead

In some cases we have acknowledged as important, it was not considered here. For reaching this aim agro-diversity conservation by establishing sustainable partnerships between researchers, local residents, and natural resource experts working in academia and on the ground in agriculture and forestry. For reaching this aim existing participatory methods have to be adapted to the transition context of Eastern Europe, and especially to the remote and intricate regions in the Caucasus, the Central Asian and Caspian region, for the “learning for participatory”, tools, the standards and the quality, life, economy and strategy, the contributions of gender age groups to livelihood, conservation habits, economic claims, and the development priorities of stakeholder groups are recommended to research in detail – as is possible to the data collection about biodiversity conservation and protection of rare species for the IIA’s. To create income alternative cooperations and participations with the local population is in around Large Protected Areas (LPA) is crucial. At detailed analysis of current local conditions on biodiversity conservation and management of LPA must also take into account existing

The descriptions include consequences for the environment, but do not close the loop by

Thank you for your comment. The section was rewritten slightly and more focus put forward on climate change modeling (2012) as the key paper in these two sections. The literature that文本 has been used has is characterized in Chapter 5.1.2. We will refer to that Chapter. We will also include a reference to the GIS work.

The scenario framework (SO4) does not provide explicit qualifications of the drivers for this to be explained

If you don’t have sustainable development around these (wildlife) parks, then

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Scenario framework (SO4) does not provide explicit qualifications of the drivers for this to be explained

We hope you find our comments – evolutionary studies from East and CA have been added to be local on socio-cultural level. Further, the interaction between these factors and the regional level development of natural resources and human settlements is thoroughly discussed.

Thank you for your comments! Please also add other sub-regions (Central Asia, Eastern Europe) to this call.

To identify commonalities, differences and transferability of participatory methods and tools to the local context and scenarios. Identifying small scale pilot projects, implement with together with populations and local experts, building on local experts knowledge and local capacity building for local infrastructure. A control point during this joint learning process is building of a couple of specific and socio-cultural realities and socio-economic changes of the so-called “Advisory boards” on national level (institutionalized in the so-called

Ways in which this scenario family is different in the context of biodiversity conservation and management is that all socio-economic parameters are fully integrated as system components in the scenarios. This means that differences in socio-ecological parameters, ways of life, public security and religions, which are crucially understanding the current transition period. On the national policy level compensation subsidies for not using restricted use of peasant land is around protected areas must be on priority for governmental regulations and/or implementing for development instruments concerning the new in member states of Central and

This section has been removed as other comments asked to reduce repetition and the Chapters are cited where needed instead

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In the next context climate change modeling (2012) as the key paper in these two sections. The literature that
Would it be useful also to present the results according to scenario archetype?

“compliment” -> “complement”?

According to the fact that the analysis will be re-done for the SOD, we do not comment on the content of this section, as the findings may change due to the new analysis.

Metapopulation and island biogeography models underrepresented in this table (second row) and in the text (here and probably in other Chapters), a serious gap given the importance of this research in assessing extinction risk.

This remained indeed vague.

To counteract the hegemonic position

This section has been removed. We now simply refer to Chapter 3 where needed rather than repeating their findings.

Other important ecosystem services include pollinator, partnership option context etc. - but more important potentially would be highlighted reviews that cover several or multiple ESS.

The TEEB reports provide a more nuanced picture of the role that monetary valuation can play within the context of (economic) valuation and possible instruments and incentives.

Although this section is explicitly about the value of ecosystem services for human wellbeing, and thus excludes nature’s intrinsic value, how will intrinsic value be dealt with, given that it is a key part of the IPBES conceptual frameworks?

Either in the text or as part of Figure 5.7 an explanation should be provided what ‘biomass’ means in the category ‘biodiversity’.

The research of Hanski and others should be consulted.

Although this section is explicitly about the value of ecosystem services for human wellbeing, and thus excludes nature’s intrinsic value, how will intrinsic value be dealt with, given that it is a key part of the IPBES conceptual frameworks?

Thank you for your comment. Yes, diverse worldview = multiple values ; single worldview = monetary.

The TEEB reports provide a more nuanced picture of the role that monetary valuation can play within the context of (economic) valuation and possible instruments and incentives.

Thank you for your comment. We use in the present version of the chapter the NCP categories agreed by IPBES to report information from the integrated modelling review.

Thank you for your comment. This concept has been added in Section 3.2 and Figure 1.4.

Thank you for your comment. The review database has been manipulated following exclusion to include more studies. We have not yet been able to compare with the findings from Chapter 2 as there is review in progress, but not at the scale for the entire section.

Thank you for your comment. We are including here only results from integrated modelling approaches. Chapter 4 already assesses changes in MNP using other approaches.

Thank you for your comment. We have completely revised our work on values and the text on which this comment is based does no longer exist.

Thank you for your comment. This section has been removed. We now simply refer to chapter 3 where needed rather than repeating their findings.

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No, diverse worldview = multiple values ; single worldview = monetary.

Thank you for your comment. This concept has been added in Section 3.2 and Figure 1.4.

This is not an existing finding. Please ensure consistency across the chapters as much as possible.

Thank you for your comment. The box on which this text was based on no longer exists.

To counteract the hegemonic position

Thank you for your comment. We have checked this reference but have not found explicit modeling work involved.

This section has been removed. We now simply refer to Chapter 3 where needed rather than repeating their findings.

This is a very crucial part of chapter 5, so we are looking forward to reading this section in the SOD.

It is worthy to differentiate between “most studied” and “most important” pressures/drivers, also in regards to Chapter 1. A change might not be most studied, but lead to changes including climate-driven landscape changes might be more critical. Agricultural intensification is particularly relevant in the interactions between human and natural systems as it also drives human population pressure. From now on, we are focusing more on climate change.

The conceptualisation of the box is vague. It is unclear whether the intention was to represent the pairwise overlay of pressures or to represent the distribution of pressures. If the latter, the representation could be misleading.

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Although this section is explicitly about the value of ecosystem services for human wellbeing, and thus excludes nature’s intrinsic value, how will intrinsic value be dealt with, given that it is a key part of the IPBES conceptual frameworks?

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the issue of efficiency should be better explained and what efficiency should mean (maybe for different resources) should be clearer to avoid misunderstandings.

For Aichi targets reference, we recommend to check for the work on biodiversity indicators on them for GBO4, which includes the work of Tittensor et al. for GBO4. Summary:

General point: other references appear to be missing e.g. Yasmi et al.

Thank you for your comment. We have rephrased this sentence now.

"initiates" -> "initiatives"

Thank you for pointing out this gap. We have tried to capture all references in this version.

In this paragraph, the further link between SDGs and not only the Aichi targets but also the CBD's vision for 2050 should be made. This is also mentioned in the placeholder, lines 1630-1632 - thank you!

This section (and maybe at some other places, e.g. chapter 5.5) should be used to make explicit the links to the SDGs.

What are the names of these visions? Who wrote them and why? What qualifies them as 'visions'?

Please check whether the CBD vision and maybe other biodiversity visions could be included in table 5.10.

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Since they were developed/adopted by the CBD parties and the UN.

Thank you for your comment. The analyses on SDGs and Aichi Targets has been further developed for the SDGs, including links to the CBD Biodiversity Strategy, see for example table 5.4.

What are the names of these visions? Who wrote them and why? What qualifies them as 'visions'?

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Thank you for your comment. We have used the SDGs new and revised in how far the visions are addressing the different SDGs. We found a great diversity of meanings in the definitions.

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Visions.

the CBD vision... included the SDGs. Visions were now formulated by actors, e.g. from private sector to address business targets or civil society to address social targets.

The analyses on SDGs and Aichi Targets has been further developed for the SDGs, including links to the CBD Biodiversity Strategy, see for example table 5.4.

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This chapter addresses bioeconomy visions. As a general comment, the bioeconomy could be addressed in more detail throughout the whole chapter 5, and including in the sub-chapter 5.4.4. One reference that might be of interest is: **[1]**. For this chapter, the concept of bioeconomy is defined throughout the chapter 5.The European Commission (2016) of the European Bioeconomy is Transforming (Bioeconomy2030), available online [https://ec.europa.eu/jrc/en/publication/12429-technical-and-research-strategies-european-bioeconomy-transition-bioeconomy2030-exploitation](https://ec.europa.eu/jrc/en/publication/12429-technical-and-research-strategies-european-bioeconomy-transition-bioeconomy2030-exploitation)

The definitions in this section are based on the FAO document on bioeconomy development, which may be of interest for this chapter. **[2]**. The FAO defines bioeconomy as: “The concept of bioeconomy is based on an integrated understanding of the complex processes in which natural resources are managed, processed, converted into products and used to generate wealth and create value. It recognizes the interdependence of natural and human systems, and integrates the consideration of economic, social, and environmental dimensions.”

**Thank you for your comment.** We have now added the following quotation: “The scope of bioeconomy development, which may be of interest for this chapter. **[2]**. The FAO defines bioeconomy as: “The concept of bioeconomy is based on an integrated understanding of the complex processes in which natural resources are managed, processed, converted into products and used to generate wealth and create value. It recognizes the interdependence of natural and human systems, and integrates the consideration of economic, social, and environmental dimensions.”

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**Thank you for the suggestions.** The reference you have mentioned is now included in section 5.4.4 of the chapter. **[2]**. We have added a link to the FAO definition of bioeconomy on the page. This is an important reference to include for the chapter, as it provides a clear and concise definition of bioeconomy.

**Thank you for your comment.** We have now added the following definition: “A number of definitions exist for the bioeconomy, e.g. the FAO (2016) refers to the use of economic activities relating to the invention, development, production and use of biological products and processes.”

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