The complete authorship is listed at the beginning of each chapter. Statistics on gender and disciplinary balance are available from the ECA TSU and IPBES Secretariat.

For reviewing purposes, it may be useful to indicate the gender-balance and ‘discipline-balance’ within the group of authors (could be illustrated with a gauge at the beginning of each box for example). This will facilitate identifying biases.

We believe that the regional ECA assessment generally has a comprehensive and scientifically sound structure. However, linkages between the chapters, especially for chapters 6, are not strong yet. For instance, it is not clear how far chapter 6 builds upon the findings and insights of the analyses within the previous chapters. While the review work, analyses and evaluations made in these chapters are by themselves very insightful, linking them more strongly to the status and trends chapter as well as the drivers/scenario/visions and pathways chapters would be very useful. For instance, the ‘status and trends’ chapter 3 might help identify where policy action is most needed and the ‘drivers’ chapter 4 determines the underlying drivers which need to be addressed by policy action. Giving more weight to these chapters in the discussion of policy options might help to derive more region-based options. As it stands now, many key messages of chapter 6 is of a more general nature.

Please explain all abbreviations when first used and then use them coherently afterwards (e.g. ILKP in the SPM).

All abbreviations have either been spelt-out or defined on first use.

Regarding knowledge gaps - please provide a section at the end of each chapter to present the relevant knowledge gaps that were identified from the reviews (for chapter 3 it’s missing). It is referred to in the SPM, p. 81:133 that relevant knowledge gaps are identified, so please ensure that all knowledge gaps identified throughout the individual chapters are then summarized and assessed in the corresponding section of knowledge gaps and uncertainties towards the end of each chapter.

There are still some gaps, placeholders or work in progress in the SOD. This makes it partly difficult to comment. Please fill these gaps effectively. Gaps have been filled throughout the document.

Limited or unequal access to NCP or genetic resources is now mentioned where appropriate.

The use of evidence sources has been comprehensively checked across the document, especially including those that integrate across chapters.

The use of gendered language has been systematically edited by native English speakers.

The geographic distribution of the chapter authors is very unevenly requested the chapter authors to ensure that all facts and figures contained in the chapters are accurately cited and adequately referenced with up-to-date sources. We also encourage chapter authors to cross-check whether the same facts and figures on a specific topic are being used throughout the assessment. Please make sure that all key messages are backed up by facts and figures.

The evidence presented in the chapter is very strong yet. For instance, it is not clear in how far chap. 6 builds upon the findings and insights of the analyses within the previous chapters. While the review work, analyses and evaluations made in these chapters are by themselves very insightful, linking them more strongly to the status and trends chapter as well as the drivers/scenario/visions and pathways chapters would be very useful. For instance, the ‘status and trends’ chapter 3 might help identify where policy action is most needed and the ‘drivers’ chapter 4 determines the underlying drivers which need to be addressed by policy action. Giving more weight to these chapters in the discussion of policy options might help to derive more region-based options. As it stands now, many key messages of chapter 6 is of a more general nature.

There are significant contributions and benefits arising from agro-ecosystems. The increase in food, feed and timber production and resulting food security has been mentioned, but not thoroughly discussed. We would therefore ask the authors to extend this discussion and provide a more balanced perspective on the increase in food security over the last decades.

Furthermore, information on traditional varieties and breeds on or genetic resources for food and agriculture is missing. Thus, the contributions of agriculture to the biodiversity of the agricultural sector have not been completely considered so far.

The use of evidence sources has been comprehensively checked across the document, especially including those that integrate across chapters.

The evidence presented in the chapter is very strong yet. For instance, it is not clear in how far chap. 6 builds upon the findings and insights of the analyses within the previous chapters. While the review work, analyses and evaluations made in these chapters are by themselves very insightful, linking them more strongly to the status and trends chapter as well as the drivers/scenario/visions and pathways chapters would be very useful. For instance, the ‘status and trends’ chapter 3 might help identify where policy action is most needed and the ‘drivers’ chapter 4 determines the underlying drivers which need to be addressed by policy action. Giving more weight to these chapters in the discussion of policy options might help to derive more region-based options. As it stands now, many key messages of chapter 6 is of a more general nature.

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The complete authorship is listed at the beginning of each chapter. Statistics on gender and disciplinary balance are available from the ECA TSU and IPBES Secretariat.
We would recommend that the IPBES Core Indicator 'Percentage of Category 1 nations in CITES is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Francesc Tubella (email: Francesc.Tubella@ipses.org).

Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Core Indicator 'Nitrogen + Phosphorus fertilizers (by 2005 total/units)' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Francesco Tubella (email: francesco.tubella@ipses.org).

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We would recommend that the IPBES Core Indicator 'Trends in Invertebrate Use' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Francesco Tubella (email: francesco.tubella@ipses.org).

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We would recommend that the IPBES Core Indicator 'Percentage of Undernourished People' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Carlo Caffèrì (email: Carlo.Cafferì@ipses.org).

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We would recommend that the IPBES Highlighted Indicator 'Wetland Extent Trend Index' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Sarah Danah (email: Sarah.Danah@unep-wcmc.org).

Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Highlighted Indicator 'Trends in invasive alien species vertebrate exaptations', is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Tim Hirsch (email: thirsch@gbif.org).

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We would recommend that the IPBES Highlighted Indicator 'Growth in species occurrence records accessible through GBIF' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Ed Lewis (email: Edward.Lewis@unep-wcmc.org).

Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Highlighted Indicator 'Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Katia Karousakis (email: Katia.KAROUSAKIS@oecd.org).

Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Highlighted Indicator 'Better Life Index' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. The data is available for only 38 countries and therefore it would be difficult to be used regionally the way IPBES has classified these. More information on this is available from the Indicator Focal point Katia Karousakis (email: Katia.KAROUSAKIS@oecd.org).

Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Highlighted Indicator 'Protected area coverage of terrestrial, marine and freshwater ecosystems' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Ed Lewis (email: Edward.Lewis@unep-wcmc.org).

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Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Highlighted Indicator 'Trends in invasive alien species vertebrate exaptations', is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Robert Hoft (email: Robert.Hoft@unep-wcmc.org).

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We would recommend that the IPBES Highlighted Indicator 'Number of world natural heritage sites per country per year' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Douglas Nakashima (email: D.Nakashima@ipses.org).

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Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

We would recommend that the IPBES Highlighted Indicator 'Wild Bird Index (Forest and farmland specialist birds)' is used in this assessment. Indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Richard Gregory (email: richard.gregory@ipses.org).

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We would recommend that the IPBES Highlighted Indicator 'Climate impacts on European and North American birds' is used in this assessment. Indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Richard Gregory (email: richard.gregory@ipses.org).

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We would recommend that the indicator "Clean Air Quality" is used in this assessment. The indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region.

Chapter author teams made use of these core/highlighted further indicators as far as possible given the delivery late in the process.

We would recommend that the indicator "Cumulative Human Impacts on Marine Ecosystems" is used in this assessment. Indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this can be available from the Indicator Focal point Benjamin Halpern (email: halpern@nceas.ucsb.edu).

Chapter author teams made use of these core/highlighted further indicators as far as possible given the delivery late in the process.

We would recommend that the indicator "Primary Production" is used in this assessment. Indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this can be available from the Indicator Focal point Tom De Koeleme (email: tom.de-koeleme@unea.org).

Chapter author teams made use of these core/highlighted further indicators as far as possible given the delivery late in the process.

We would recommend that the indicator "Water Quality Index for Biodiversity" is used in this assessment. The indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this can be available from the Indicator Focal point Hartwig Kremer (email: hartwig.kremer@unep.org).

Chapter author teams made use of these core/highlighted further indicators as far as possible given the delivery late in the process.

We would recommend that the indicator "Number of Parties to the CBD that have deposited the instrument of ratification, acceptance, approval or accessions of the Nagoya-Protocol" is used in this assessment. Indicator information is available from the BIP website www.bipindicators.net. This indicator can be disaggregated/made available for this region, more information on this can be available from the Indicator Focal point Tom De Koeleme (email: tom.de-koeleme@unea.org).

Chapter author teams made use of these core/highlighted further indicators as far as possible given the delivery late in the process.

A few points on references: 1) In general, there is a need to check references in the chapters. Specifically, EEA reports are not referenced consistently, e.g. in some chapters it is EEA XXXX, while in other chapters European Environment Agency XXXX. 2) Chapter 3 doesn't seem to contain any reference to EEA materials, which seems a bit odd given the many relevant EEA publications. 3) Some EEA references are not the most current one, e.g. Climate change, impacts and vulnerability in Europe 2012 is referenced although there in 2016 report. References have been systematically checked and standardised throughout the document using the Mendeley bibliographic software.

A glossary has been created as suggested

Overall: the EEA assessment is looking really good. Many congratulations to all the authors. I have focused the great bulk of my comments on issues directly related to data modelling for the EEA against IUCN standards, especially in the light of the provision of these data for IPBES in https://www.nature.com/articles/sdata20167, and of UICN's strategic partnership with EEA in general.

Trade-off is here consistently meant to indicate a negative relation between two variables of interest, e.g. between two NCPs. Mitigation of a trade-off is then meant to improve the situation of both NCPs.

Suggestions for improvement:

The Netherlands: Astrid Hilgers

Financial cost-benefit analysis for policymakers/society are missing, as it is important to name such considerations explicitly. Also, certain definitions should be defined more precisely.

Discussion of the economics of ES (valuation) has been increased in the document, especially in Ch3.

Chapter author teams made use of the core indicators as far as possible given the delivery late in the process.

Kremena Gancheva

The draft assessment is an impressive and very informative work. It can, also, be seen that the drafting and peer review process are flexible enough to incorporate very recent work very well despite the long drafting cycle.

It would be helpful to incorporate a feedback mechanism from stakeholders as well, and particularly now that new information that becomes available on a running basis. For example, the Baltic Sea mapping and assessment under NATURA 2000 - some 600 of the country - for ecosystem conditions and biophysical valuation of ecosystem services was completed in April, 2017. BIPAS has mapped six of the nine ecosystem types in Bulgaria, and has had the lead role in developing the underlying methodology framework. However, the final reports are under verification and publication process as it is to follow, with findings being systematised. Similarly, work is underway in other countries too.

Thank you for the suggestion concerning new literature. The IPBES guidelines require us to establish a cut-off date for literature (April 2017), but we have attempted to be flexible in incorporating more recent, but highly important, material.
The assessment's description in Chapter 1 appears anthropocentric without a clear focus on humans as part of nature. Since the assessment clearly notes (Table A1.1, Figure 1.2) that the IPBES has a scope overarching earlier assessments such as MA, TEEB, and EAS together with a holistic view on nature, the introduction, too, may need to put more emphasis on the socio-ecological system as a single entity rather than merely a source of benefits for humans.

This could lead on to introducing insights at the sector-level and loss-benefit options, including the ecosystem disservices, as well as a more systemic view at the continuum of states in which the socio-ecological system is evolving over time. It would bring out more clearly the NATURE component of the IPBES-CF, in particular in the Mother Earth and Systems Values categories which appear to be underrepresented in the current draft. Their equivalent in Western science appears to be not the entire body of knowledge on biodiversity and ecosystems but rather the parts of ecology that treat ecosystems from the energy/entropy/information/theory points of view.

The overall coherence of the chapter is to be improved; there is quite some redundant information in the sub-sections (for example on trends or between 2.1.3 and 2.2.2). We hope that the more narrative addresses this problem.

Despite the fact that you state in the introduction that there are differences between E2S and NCP, the two concepts have been used as synonymously. This is confusing. The need to partly substitute E2S by NCP in the IPBES is not clear. In any case, the terminology should be consistent throughout the chapter.

A clear statement on pending evidence and future research needs should be included in all sections (as for example given in 2.2.4.2 and in the other health sections). This is now included in section 2.5.

Table of guideline given for ECA assessment of using APA 6th edition style.

Check quotation style in the entire chapter.

Make sure abbreviations are explained in the Ex summary. It will be a list of abbreviations in the whole ECA assessment.

A clear statement on lacking evidence and future research needs should be included in all sections (as for example given in 2.2.4.2 and in the other health sections).

A clear statement on pending evidence and future research needs should be included in all sections (as for example given in 2.2.4.2 and in the other health sections).

This is now included in section 2.5.

This Chapter has been extensively reviewed and is much better than the FOD. Some sections that were incomplete in the FOD have been revised, notably that on pollination, but the messages were actually derived.

It would bring out more clearly the NATURE component of the IPBES-CF, in particular its Mother Earth and Systems Values categories.

We are very sorry, but we have to edit down the whole chapter because we have the mandate to provide confidence levels only in the executive summary. It is covered in detail in chapter 4 and in the present chapter we can only cover the consequences in terms of fertile soils losses.


This could lead onto introducing insights at the win-win and lose-lose options, including the ecosystem disservices, as well as a more systemic view at the continuum of states in which the socio-ecological system is evolving over time. It would bring out more clearly the NATURE component of the IPBES-CF, in particular in the Mother Earth and Systems Values categories which appear to be underrepresented in the current draft. Their equivalent in Western science appears to be not the entire body of knowledge on biodiversity and ecosystems but rather the parts of ecology that treat ecosystems from the energy/entropy/information/theory points of view. This is clarified in chapter 1.

Ch.2

Please double check that the understanding of sub regions within ECA is kept equally, this does not always seem to be the case. This is now included in section 2.5.

Definitions of NCP are now given in Chapter 1 and we have followed them. Now included.

We follow the guidelines given for ECA assessment of using APA 6th edition style.

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Graciela, thanks for your constructive comments and positive message. It is very much appreciated.

We have the mandate to provide confidence levels only in the executive summary. It is covered in detail in chapter 4 and in the present chapter we can only cover the consequences in terms of fertile soils losses.

We have the mandate to provide confidence levels only in the executive summary. It is covered in detail in chapter 4 and in the present chapter we can only cover the consequences in terms of fertile soils losses.

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Narrative of SPM and key messages has changed

Good amount of literature on indicators and models

Check that all subregions are covered roughly equally in terms of values.

Congratulations to all the authors and review editors on excellent work to collate and present the material. The chapter is impressive.

We do really appreciate this positive comment. Many thanks!

Strong bias to WE! The lack of the analysis of the subregions. The paragraph 2.2 is totally missing in the summary

In my opinion the draft is a really thoughtful work that will for sure improve the IPBES assessments. Nevertheless I would like to point out that the draft might pay more attention to the ecological role of predators scavengers to provide ecosystem services. Large predators and obligate scavengers (in vultures) are among the most threatened functional groups in ecosystem worldwide. In spite of, they are key groups in ecosystem functioning that provide with important ecosystem services in relation to the regulation of food webs, the elimination of carcasses, CO2 emission savings, control of pests and parasites. Furthermore, humans and scavenging vertebrates, have been interdependent since the Late Pleistocene, when early hominins turned to meat as a food source. The close relationship with scavenging birds and mammals has benefited humans since the origin of early Homo species in multiple ways. For instance, the removal of animal debris before putrefaction has played an important hygienic role for millennia (Moleón & Sánchez-Zapata, 2014. Bioscience, 64: 394-403). I consider that the draft might improve with an insight on the role of facultative and obligate scavengers in ecosystem function and services.

References:

When applicable, i.e. when different value types are mentioned or discussed, please refer to the values table and definitions in Chapter 1 that introduces and defines all value types in the assessment. This will be supported to each ECA chapter

In this new version, we add a new section of values that covers the four regions, when data is available

Astrid Hilgers

The geographical bias is strongly recognized in section 2.5. and we have made many efforts to include other subregions

We do not understand this comment

The sections have been equally distributed (1038 words per NCP). Chapter 1 defines differences between NCP and ESP

In this version, we would avoid to use this word

We provide some of this information in the executive summary and in knowledge gaps. The structure of each section was already agreed in the second authors meeting and approved by all the authors.

Check that all subregions are covered roughly equally in terms of values.

In this table, suggestions are made for maps to illustrate some sections of the different chapters. A document with a number of examples. (referred to below) is available at:

https://tinyurl.com/ECA-Maps

ECA sharepoint site login required

We do not really appreciate this positive comment. Many thanks!

The geographical bias is strongly recognized in section 2.5 and a final section of knowledge gaps is in 2.5.

In the final version, we follow the same structure for all NCP: basic description, capacity for its supply in ECA and across subregions, its demand and use in ECA and across subregions and a short introduction about its contributions to quality of life. The economic and non-economic values can be found in rows 2.3.5 and a final section of knowledge gaps is in 2.5.
In the new version, we invite an expert (Dan Faith) to address this NCP and we now provide a general overview of maintenance of options in ECA. The final document has this information as a section.
Phylogenetic diversity is a likely good measure of option value (see below). Over the past decade or more, a strong case (reviewed in Faith 2017) has been made for an indicator of "maintenance of options" as the estimator, over multiple taxonomic groups, of the maintenance of phylogenetic diversity ("PD"; sensu Faith 1992). Janzen et al. (2012) argued that a simple challenge in biodiversity conservation is to find a "robust proxy" for global option values that effectively captures potential future values to society. They concluded that "maximising the retention of phylogenetic diversity (PD) should also maximise option value." Cadotte and Davies (2013) argued that "maximizing the preservation of PD will also tend to maximize the preservation of "future diversity."" Jost (2014) suggests that, while any particular taxon may be phylogenetically valuable, PD captures the integrated genotypic and phenotypic value of a lineage and so represents both measure (e.g., present) and a measure (e.g., future) function and capacity. (See also Lath et al. 2015; Mouillot et al. 2016; Pollock et al. 2017) Support for PD as a measure of option value has found also in the philosophy of science work (e.g., Macleod and Sterelny 2018) and among economists (e.g., Hagedorn, K., and C. Puppe 2004). Arrieta et al. (2010) have explored how recent discoveries link to phylogenetic diversity. Fig 2 http://www.pnas.org/content/107/11/18318.bst The PIMES catalogue of assessment illustrates the link of PD to option value, based on the many foods and medicines discovered in plants. http://catalog.ipbes.net/assessments/144 "Phylogeny and the sustainable use of biodiversity: an assessment based on the Survey of Economic Plants for Arid and Semi-Arid Lands." Forest et al. (2007) explored PD and option value using an estimated phylogenetic tree for genera found in the Cape hotspot of South Africa. Forest et al. (2007) determined that, while they did not know about these medicinal, food, and other uses, then preserving sets of species with high PD would be a good way to preserve these unknown benefits. PD captures option values well because it reflects "Natural diversity." This link is well corroborated through the many tests (moderate to high confidence based on many published PTP tests that corroborate the PD model; e.g. Slávíčková and Coelho 1998; Willsmon et al. 2002). A well-established framework for quantifying such global option values of biodiversity is "phylogenetic diversity." "Phylogenetic diversity" trades in two ways: 1) How well PD is represented well in the regional and global protected areas system? How much PD in P1 is geopolitically protected from imperilled species with red lists? 2) Pollock et al. (2017) [Extended Data Figure 3](https://www.nature.com/articles/s41598-019-43169-4) shows the global and regional priority of phylogenetic diversity. See Extended Data Figure 3 [https://www.nature.com/articles/s41598-019-43169-4](https://www.nature.com/articles/s41598-019-43169-4) for hotspot areas having lots of poorly protected PD for fish and for corals. Fig. 1B and text http://www.nature.com/articles/artic01039 2. The studies above address the "maintenance of options" challenge of securely representing PD in protected areas. A complement to these efforts is to assess, for many taxonomic groups, how much PD currently is imperilled (based on red list assessments of imperilled species). The assessment of imperilled PD is well-established in the EDGE program. The value to people of NCP18 is illustrated well by this successful global program, EDGE (see references), based on preservation of PD. The EDGE of Existence programme highlights and conserves phylogenetically distinctive species that are "imperiled" or on the verge of extinction. This program provides a global overview of the major related regional and global studies (listed in references) provides the existing data useful for this assessment of NCP18. Typically these studies, over many different taxonomic groups, integrated red list assessment with estimates of Evolutionary Distinctiveness (ED) of species. Evolutionary Distinctiveness (ED) measures the proportion of total phylogenetic diversity (PD; measured as the sum of branch lengths in millions of years) by giving the species credit for a branch inverse-weighted by the number of species sharing that branch) (Brock et al., 2005). Globally, for multiple taxonomic groups, we now have tabulated published lists of ED associated with good phylogenies, and have not red list assessments of the species. We could sum-up total ED values or count number of EDGE species in the region. The most useful summary of this available information is simply the sum of the tabulated ED values of the threatened species, as this approximates threatened or "imperiled" PD – thus, providing information linking biodiversity status and change to change in NCP18. “Technical comment – tabulate for all groups focus on so-called ED values (phylogenetically distinctiveness: the total PD is divided up among the species where the ED score for a species is the sum of its ancestral branch lengths, each doubled by the number of descendants of that branch). Thus, each species gets partial credit for overall PD. This is dominated naturally by terminally branched length, but includes a fractional part of each deeper ancestral branch. Available tabulations of ED scores for species therefore are informative – the total of all ED scores is the total PD and the total of the ED scores for all imperilled species approximates nearly the total imperilled PD (an estimate of expected loss of PD). This use of the available tabulations, with its links to red list categories, is more informative that popular simple summing up a region of all ED values this has been shown to be a relatively weak indicator of total regional PD (Faith 2016)). Thus, NCP18 can be assessed through the integration of two kinds of existing information: the accepted core indicator information on red list, and information on a recognised measure of biodiversity that links to option value. Below, we show the draft assessments for multiple taxonomic groups (and have emailed this to one or more of the ACAL). The total of all PDs allocated to the region is national in these draft diagrams; it is not yet tabulated as a portion of the overall tabulated global imperilled PD for a given group. I can provide this, plus more descriptive text as needed.

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Arrieta, Jesús M., Sophie Armard-Hoehndorf, and Carlos M. Outes (2020) What lies underneath: Conserving the ocean’s genetic resources. PNAS 117.2: E118-1E118


Cadotte MW and Studivants DS (2017) Recent trends in the area of rare: advances in combining evolutionary distinctiveness and rarity to inform conservation at biogeographic scales. Diversity and Distributions, 23, 176–181


Chapter 2 needs a better linkage between NCPs and nature based solutions

First of all, I'd like to emphasise the really thoughtful work behind this draft. Second, I'd like to indicate that it could gain much if it would treat more in depth the ecological role of predators and scavengers to provide ecosystem services. Large predators and obligate scavengers (e. natures) are among the most threatened functional groups worldwide. At the same time, they exert important influence on ecosystem functioning and provide essential ecosystem services in relation to food web regulation, carcasses removal, C02 emission savings, and pests and parasite control. Moreover, humans and scavenging vertebrates have been interdependent since the Late Pleistocene, when early hominins turned to meat as a food source. The close relationship with scavenging birds and mammals has benefited humans since the origin of early Homo species in multiple ways. For instance, the removal of animal debris before putrefaction has played an important hygienic role for millennia. Thus, in my opinion, the draft might improve by explicitly mentioning the multiple roles of scavengers (both facultative and obligate) in ecosystem function and services.

References:

In this new version, we invite an expert (Dan Faith) to address this NCP and we now provide a general overview of maintenance of options in ECA with its relevant literature.

...continued from previous page...

We did now an effort to provide a general overview wihtout putting so much emphasis en local case studies. We provided them at the end of the whole document. In the new version, we invite an expert (Dan Faith) to address this NCP and we now provide a general overview of maintenance of options in ECA with its relevant literature.

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There is a need to contextualize from the beginning the approach to multiple conceptualizations of values in all assessments according to the proposal in the guide on values.

We need to address this aspect in the section on values.

In this new version, we have invited three experts in the topic (JA Sanchez-Zapata, M Molendin and Z Morales) to add to this topic, which actually contributes to assess the NCP of regulation of detrimental organisms. So, thanks for this suggestion.

There is a need to contextualise from the beginning the approach to multiple conceptualizations of values in all assessments according to the proposal in the guide on values.

One issue of concern is that microbial biodiversity is by large overlooked in this chapter. Microbes are a major component of the human environment. In the light of accumulating evidence linking human microorganisms and diverse environmental microbial exposures with health and disease, including resistance to NCD’s and infections, the environmental microbial biodiversity should be mentioned in chapter 2.3. In fact, exposure to microbes during the perinatal period of life may explain many of the health benefits that contact with nature has to offer. Microbes may also connect with nutrients and medicinal plants, since both may exert some of their positive health effects by regulating gut microbiota. In fact, the evidence linking human microbiota and diverse environmental microbial exposures with health and disease, including resistance to NCD’s and infections, the environmental microbial biodiversity should be mentioned in chapter 2.3. In fact, exposure to microbes during the perinatal period of life may explain many of the health benefits that contact with nature has to offer. Microbes may also connect with nutrients and medicinal plants, since both may exert some of their positive health effects by regulating gut microbiota.

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Multiple sclerosis patients have a distinct gut microbiota compared to healthy controls. Sci Rep. 2020;10:24884.


It would be relevant to include a review of the trends in soil condition related to the use of mineral fertilizers and agrochemicals. At least to indicate that there is little documentation of trends. Also, it would be relevant to include a review of the state of the biological capacity of soils (e.g., little known). This paragraph is in italics. That air quality is declining may not have done so with a decline in total pollutants. It is unclear what ‘regeneration of air quality’ means, and also what decreases in ‘air quality regulation involving trees, lakes and wetlands’ would help to include first a brief statement of what ‘air quality regulation’ means in this context. Many readers will likely not understand what this is about.

Sometimes NCPs are described in terms of ‘use’ and in others as the capacity of the system to generate these contributions. This may be a bit confusing for those unfamiliar with ES frameworks. It would be more straightforward here to refer to ‘generation’ or ‘production’ of material NCPs. Would it be possible to review the trends in the level of human inputs (as distinguished from the contribution of nature to food production)? In the next paragraph ‘food provision’ is used, for instance.

The ecological footprint is an established tool to communicate human dependency on nature, yet its scientific soundness is highly disputed. Given the importance of this assessment and the need to develop a vision of the future in which biodiversity is no longer sacrificed for unsustainable levels of use (the mismatch between ‘supply and demand’)

The statement ‘linguistic diversity has been shaped by biodiversity’ seems to be based on a limited geodeterministic understanding of cultural development and no evidence has been provided in the respective sub-section that would underscore this statement. This is a debatable issue and some reviewers highlight literature on the link between biodiversity and linguistic diversity but this has been changed in the message and main text to make the comment less deterministic.

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This message is discussed in the final key message when biocapacity is discussed. The issue is discussed at the end of key message 3.

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This needs to be explained further. What role did these different events and processes (such as CAP) play for food production?

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These three given reasons are not self-explanatory. Why is there for instance only a reference to the nutritional value of wild foods?

**...relational and instrumental values...** Needs to be defined in Chapter 1

Would it be possible to move this graph and a bit of explanation in the previous section (executive summary?)

Thanks for spotting this out!!!

We deleted the word component.

This is a bit difficult to follow. Which % of these protection categories is found in ECA?

Is "established" a confidence term? If so to be used between brackets. If noy alternative wording should be used.

Could this paragraph be linked to those above about the contributions of nature to food and water?

they are now defined in chapter 1 and in the introduction to chapter 2

This NCP is now added as a NCP in section 2.2, so it is also included in the introduction as requested.

The decision is that we use Nature's contributions to people (NCP) when synthesizing, summarizing and assessing information. The term ecosystem services is used when referring to literature which uses the ecosystem services term. So, we use NCP as much as possible in the executive summary.

We explain that Nature's contributions to people (NCP) is used when synthesizing, summarizing and assessing information. The term ecosystem services is used when referring to literature which uses the ecosystem services term. For the differences between the two, the explanation is given in chapter 3.

Regarding the knowledge gaps and necessary researches

We use NCP as much as possible in the executive summary

Executive summary does not have figures. So it is not possible

We used the same color coding as Patoul et al. (2017) for coherence with ESS, but a graphic designer is helping with figures. We delete the numbers of NCP according to reviewer's suggestion.

We suggested some modifications on Figure 2. It would remove the numbers 1-15 or think about a more graspable presentation, write either non material or non-material and show other color coding.

Under 15: Sacred sites: ES use: Could be Nr of people attached to sacred sites.

We consider NCP 18, as given by the general classification of IPBES.

There should be more examples to clarify the role of marine ecosystems in regulating NCPs, other than habitat creation and maintenance (e.g., climate regulation, water purification).

Table 2.1: Indication of which ecosystem service component is assessed in this chapter per each Nature's Contribution to People (NCP) - but NCP18 is not an ecosystem service

Table 2.1: Table 2.1. The table also makes clear that the NCP 18 is not an ecosystem service.

We consider NCP 18, as given by the general classification of IPBES.

There should be more examples to clarify the role of marine ecosystems in regulating NCPs, other than habitat creation and maintenance (e.g., climate regulation, water purification).

I would suggest to indicate in the table (and when appropriate) that ES 'use' has been in many contexts referred to 'benefit'. It makes more sense in the case of 'years of life gained'.

We were not able to create a systematic overview for all indicators of all NCPs.

We made more clear that the NCP was not a systematic assessment of all components across all NCP, rather, the Table pinpoints to indicators used. We added more on economic values, as this part was developed after the ESS.

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This table is a summary of the systematic evaluation of indicators we found in the literature (mostly English literature).

This table is a summary of all indicators used in the assessment. We made this more clear.

The goal was not to assess all aspects of NCP.

This table is a summary of all indicators used in the assessment. We made this more clear.

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This table is a summary of all indicators used in the assessment. We made this more clear.

As is clear, the table is a summary of the systematic evaluation of indicators we found in the literature (mostly English literature).

The table is a summary of all indicators used in the assessment. We made this more clear.

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there can be even very local mismatches between ES provision and in addition to the regional/country-scale ones. There is a studying looking at the European cities of Stockholm, Berlin, Rotterdam, Barcelona and Salzburg, which shows the moderate contributions of urban ecosystems to Environmental Quality Standards due to spatial mismatch between demand and supply of the FAO-10, N2O and GHG capture services. This study is referenced in: Balseux, F., Haase, D., Gómez-Baggethun, E., Frantzeskaki, N. 2015. Mismatches between ecosystem services supply and demand in urban areas: A quantitative assessment in five European cities. Ecological Indicators 55: 146-154.

Originally (in the MA), habitat creation was classified as a supporting service and therefore, at least, it might be better not to start a discussion on regulating services with the example of habitat creation. However, I can see a logic for doing so: start with the habitat and then move to the “real” regulating services. If so, perhaps some acknowledgment for different views on how to classify habitat creation should be included. Nevertheless, the (continued) emphasis on numerals seems strange. One could view habitat creation in terms of habitats for all species (the original intention), fish or for species important to humans, as explicitly stated here, acknowledging the IPES definition. However, taking the apparently narrower definition probably takes us to all species, or at least those that people are aware of, simply because most species are important to people; I understand that, following this logic, this section could get to far too long so I would suggest, at acknowledging the broader definition and by choosing some other (additional) examples. For example, you might include habitats for hunted species, natural refuges and/or pollinators. As a last example would link well to the next section on pollinators. Indeed, that section does not acknowledge the fact that pollinators are dependent on particular habitat conditions.

In Corsica, large and continuous forests of C. balearica cover more than 2500 m² and (Cheminée et al., 2013) estimate that depletion of such forests would potentially result in the loss of 50% of species and 88% by value of commercial landings. Because it is not a measure of the status and trend of NCP capacity or use, it is not considered in Section 2.2 and potentially overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other values types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IPES/Chapter 2 puts us economic value as the sole measure of importance of the NCP.

Please remove ‘and 88% by value of commercial landings’ and suggest it as an addition to the authors of Section 2.3.5. Because it is not a measure of the status and trend of NCP capacity or use, it is out of context in Section 2.2 and potentially overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other values types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IPES/Chapter 2 puts us economic value as the sole measure of importance of the NCP. Finally, the valuation method is not always clearly mentioned.

Please remove the emphasis which refer to extinction values and suggest it an addition to the authors of Section 2.3.5. Because it is not a measure of the status and trend of NCP capacity or use, it is out of context in Section 2.2 and overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other values types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IPES/Chapter 2 puts us economic value as the sole measure of importance of the NCP. Finally, the valuation method is not always clearly mentioned.

Please refer to the previous peer-reviewed studies on the importance of inter-regional flows. We prioritize the other inter-regional flows in the final version, but unfortunately, we are not able to remove them. However, as the IPBES NCP classification recognizes, it exists the possibility to split one category into its components, e.g. for this particular NCP, one can focus on pollution or on seed dispersal or on both. We decide to focus only on pollution.

15
Due to the required reduction in wording, this sentence is no longer in the document.

Due to the required reduction in wording, this sentence is no longer in the document.

Please remove overlapping statements about values and good quality of life. Pollinators etc. contribute to other NCPs and to aspects of good quality of life, and these must be mentioned separately.

Due to the required reduction in wording, this sentence is no longer in the document.

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The total net benefit of vegetation in cities can be small relative to total emissions, for example, urban forests in Barcelona in 2008 removed 35% of NOx pollutants and 19.3% of CO2e, representing 2.6% of PM10, 0.43% of NO2, and 0.47% of CO2e emissions, but locally the amount removed can be very important (Baró et al., 2014).

The presented numbers should be put in perspective so that the reader could understand their significance. Pure numbers do not tell much for a non-expert. Are these processes significant for the air quality?

We decide to keep the original one as both present redundant information.

Thank you. This reference has been included.

Please remove overlapping statements about values and good quality of life. Pollinators etc. contribute to other NCPs and to aspects of good quality of life, and these must be mentioned separately.

Please remove overlapping statements about values and good quality of life. Pollinators etc. contribute to other NCPs and to aspects of good quality of life, and these must be mentioned separately.

The information of monetary values has moved to other sections that focus on this aspect. We avoid also this way of presenting the information.

We review this paragraph according to all the changes suggested in this section by reviewers. Now it reads differently.

Please remove this whole section which refers to economic and monetary values, and transfer it to Section 2.3.5. Because it is not a measure of the status and trend of NCP capacity or use, it is not in context in Section 2.2 and overlaps with information covered in Section 2.3.5 (valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IPBES / Chapter 2 puts economic value as the sole measure of importance of the NCP. Finally, the valuation method is not consistently mentioned.

ECA values bias group
Ch.2 2 539 21 540
Please remove this whole section which refers to economic and monetary values, and transfer it to Section 2.3.5. Because it is not a measure of the status and trend of NCP capacity or use, it is not in context in Section 2.2 and overlaps with information covered in Section 2.3.5 (valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IPBES / Chapter 2 puts economic value as the sole measure of importance of the NCP. Finally, the valuation method is not consistently mentioned.

UK: David Forman
Ch.2 2 549
Reference sentence not in usual format.

The text has changed so "regulation" is not used in this context.

The word "regulation" is associated to human-made control, which is not the case when considering the role of forests in the air quality. Better option could be e.g. "impact."
Ch.2

The NOx deposition rates in the figure appear far too high. A statement about the limited capacity of trees in urban areas has been included.

Ch.2

Please explain what is the reason for this difference?

Ch.2

Contradicting sentences.

Ch.2

There exists no forest which could be able to absorb all the toxic gases?

Ch.2

This chapter is based on information from UNCCl reporting trends should be included, stating that there is a net change in Europe. Need to refer to a single paper which shows opposite results, with a neutral balance when forests, grasslands, croplands and wetlands are accounted for. This difference should be explained and discussed. Need Turkey is explained as a single country, even though it is not stated how significant Turkey is as compared to the rest of Europe.

Ch.2

This text refers to Fig. 2.12, in which Finland is the only country with a change from a sink to a source, so presumably the text refers to Finland. The information in 2.12 must be wrong. Thank you for this comment. The section has been reorganised to provide a better structure and a more consistent content. The reference to Turkey has been deleted.

Ch.2

Why are the net removals of Kazakhstan and Uzbekistan treated in detail here? Perhaps some justification would be needed?

Ch.2

The information in this figure, related to Finland, is wrong. See a comment from page 25, line 641 to page 25, line 645 above. The stats for other countries were not checked.

Ch.2

The information in this figure, related to Finland, is wrong. See a comment from page 25, line 641 to page 25, line 645 above. The stats for other countries were not checked.

Ch.2

In boreal forests, underground carbon storage is larger than aboveground storage. And more carbon is stored in the soil than in the vegetation.

Ch.2

The information in this figure, related to Finland, is wrong. See a comment from page 25, line 641 to page 25, line 645 above. The stats for other countries were not checked.

Ch.2

The information in this figure, related to Finland, is wrong. See a comment from page 25, line 641 to page 25, line 645 above. The stats for other countries were not checked.
This particular sentence has been deleted, and the paragraph has been updated and improved.

This section explicitly deals with trends in the freshwater NCP. Relations between this NCP and other NCPs are partly covered in the water security section (2.3.1) as well as section 2.4. However, please note that relations with other NCPs have not been covered in any other NCP section, as this was beyond the scope of our assessment.

This section has now been done, thanks for the suggestion.

This sentence is not clear. Please review. Also, pls explain the role of Western European countries for water availability in Central Europe more clearly. As it stands now, it seems rather judgemental.

This distinction has been further clarified, and the section has been restructured to further clarify it.

This sentence has been revised. Any wording that could be observed as judgemental has been removed.

This section has been revised. Any wording that could be observed as judgemental has been removed.

This section was completely revised so that this sentence does not exist any more. Thanks anyway.

The distinction method is not always clearly mentioned.

This section was completely revised and the term "biophysical system" will be used further on.

This section explicitly deals with trends in the freshwater NCP. Relations between this NCP and other NCPs are partly covered in the water security section (2.3.1) as well as section 2.4. However, please note that relations with other NCPs have not been covered in any other NCP section, as this was beyond the scope of our assessment.

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This section was completely revised and the term "biophysical system" will be used further on.

This section was completely revised and the term "biophysical system" will be used further on.

This has now been done, thanks for the suggestion.

This has been improved.

This has been improved.

This is addressed in table 2.1.

Please remove this sentence which refers to monetary value and suggest it as an addition to the authors of Section 2.3.5. Because it is not a measure of the status and trend of NCP capacity or use, it is out of context in Section 2.2 and overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that ISSIS / Chapter 2 puts economic value as the sole measure of importance of the NCP. Finally, the calculation method is not always clearly mentioned.

This is addressed in table 2.1.

This section was completely revised so that this sentence does not exist any more. Thanks anyway.

This section was completely revised so that this sentence does not exist any more. Thanks anyway.

This section was completely revised so that this sentence does not exist any more. Thanks anyway.

Money values have been removed of this section.

This section explicitly deals with trends in the freshwater NCP. Relations between this NCP and other NCPs are partly covered in the water security section (2.3.1) as well as section 2.4. However, please note that relations with other NCPs have not been covered in any other NCP section, as this was beyond the scope of our assessment.

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Biological interactions (such as symbiotic fungi (michoryza) contribute importantly to water and nutrient uptake by plants.

Andrew Wade Ch.2 31 680 32 875 River systems draining farmland and urban areas with a major groundwater component are projected to take a long time (100s of years) to recover from past pollutant inputs and this may confound current and future attempts to improve water quality. For example, a model-based assessment of the River Thames demonstrated that it would take at least 100 years for the stream water nitrate concentrations to return to 1000s/week even if nitrate inputs were reduced to zero. More details are given in: Jackson et al. 2007. Catchment-scale modelling of flow and nutrient transport in the chalk-seated unstratified ecological Modelling 209, 45-52.

Andrew Wade Ch.2 31 689 32 875 In the discussion about phosphorus... perhaps include the paper - Powers et al. 2016. Long-term accretion and transport of anthropogenic phosphorus in three river basins. Nature Geoscience 9, 353-356, the paper discusses how phosphorus, over long time scales, can become remineralised.

Graciela Rusch Ch.2 31 692 32 875 The relationship between the loads (release/retention) and the limitation to primary production do not follow from each other in a direct way. Please explain what this refers to.

Mark Smeets Ch.2 31 699 32 875 ECA value assessment grid. Over 65% of European wetlands existing at the beginning of the 20th century were lost by 1990. --Odd juxtaposition of two rather similar data facts.

Graciela Rusch Ch.2 31 702 32 887 It is important to highlight that conservation/protective measures have worked and indicate which ones!

This section was completely revised and shortened so that this information was removed due to lack of available space.

Thank you very much for this additional information, however for space reasons we are forced to limit the amount of information that focus on these NCP status and trends.

Thanks but we need to be very selective in the choice of papers that only describe status and trends of natural services and benefits.

This section was completely revised and shortened and attention was paid to focus on the water, especially aquatic waters.

Johannes Langemeyer 31 688 32 892 Some countries, such as Estonia, do have national inventories of wetlands [in Germany this information is collected by specific regions, e.g. Niederwurmsachsen]

Johannes Langemeyer 31 693 32 892 Avoid repetition, this paragraph comes back to what was said before. Summarise facts in a table and shorten text. Similar comment to next paragraph...

ECA value assessment grid. There's quite a lot of background/contextual text in this section that could be reduced.

We found very little references to ecosystem services provided by sediments (see Walt et al. 2004). Their contribution to freshwater quality is covered in section 2.2.4.5.

This section was completely revised and shortened also that indeterminacies were avoided.

Nadine Goris Ch.2 31 711 32 897 Section what high-value habitats are, it is biodiversity rich?

Nadine Goris Ch.2 31 717 32 897 Number should be superscript, also the reference is missing.

Nadine Goris Ch.2 31 721 32 897 Yes, 'The directions that were able to improve water quality are now mentioned, like European directives.'

Johannes Langemeyer Ch.2 32 897 33 900 This is the highest capacity to provide this NCP? The last statement has an unclear connection.

This section was completely revised and maintained.

Mark Smeets Ch.2 31 724 32 898 No: had better to have a general indication, also the reference is missing.

Johannes Langemeyer Ch.2 31 706 32 898 It might be better to say 'improved wastewater treatment' rather than 'water purification'. I'm not sure final effluent can be described as pure water.

Johannes Langemeyer Ch.2 31 711 32 898 Reference is missing in the list of references this NCP.

Johannes Langemeyer Ch.2 31 715 32 898 The effects of CC on the service delivery should be included in the drivers section.

Johannes Langemeyer Ch.2 31 715 32 898 Doesn't make sense: see (very clear) introductions to other NCPs on lines 719 and 799. Also this introduction to the soil sub-sections is rather narrow and does not introduce the reader to the important topic that follows, which, essentially, cannot be sufficient indicator of IS generation.

Johannes Langemeyer Ch.2 31 721 32 898 This section was completely revised and maintained.

Mark Smeets Ch.2 31 721 32 898 This section was restructured and partly re-written.

Mark Smeets Ch.2 31 725 32 898 We changed to soil quality which is broader. Soil related NCP involve soil fertility has been defined as an NCP (see IPBES conceptual framework).

Mark Smeets Ch.2 31 729 32 898 Water quality should be more understandable now

Mark Smeets Ch.2 31 729 32 898 This paragraph was really shortened in order to condense the chapter and...

Mark Smeets Ch.2 31 729 32 898 Thank you for the suggestions, References have been included

Hanna Skryrén Ch.2 31 729 32 898 This section was restructured.

Hanna Skryrén Ch.2 31 733 32 898 With what CAT it seems necessary to add the data on CA

Hanna Skryrén Ch.2 31 737 32 898 Reviewed this information trying to clarify for CA. References were added for CA.

Graciela Rusch Ch.2 31 739 32 898 Present these facts in a summary table?

Graciela Rusch Ch.2 31 743 32 898 This paragraph was really shortened in order to condense the chapter and...

The Netherlands: Astrid Hagens Ch.2 31 743 32 898 It's not clear which status is addressed here. The status of the need for erosion prevention, the amount of erosion, or the amount of the capacity to protect against erosion?

The Netherlands: Astrid Hagens Ch.2 31 747 32 898 The focus here is on the relation to climate. It is not completely relevant; better to address more the relation with management, which expresses the human-induced erosion while the relation with climate merely addresses the relation with erosion as a geological, landscape forming process.

Graciela Rusch Ch.2 31 751 32 898 Water quality should be more understandable now

Graciela Rusch Ch.2 31 755 32 898 Review the section and figure. See also fig 2.1.8.

Graciela Rusch Ch.2 31 759 32 898 Various transformers of the paper have been used and some of them will be redrawn by TUS.

Graciela Rusch Ch.2 31 763 32 898 Various transformers of the paper have been used and some of them will be redrawn by TUS.

Graciela Rusch Ch.2 31 767 32 898 Thanks!

Graciela Rusch Ch.2 31 771 32 898 Thank you for the suggestions, References have been included

Graciela Rusch Ch.2 31 775 32 898 Thank you for the suggestions, References have been included

Graciela Rusch Ch.2 31 779 32 898 This section was restructured and partly re-written.

PESC-4: Kristina Raab Ch.2 31 783 32 898 photographic contribution to soil fertility was mentioned.

PESC-4: Kristina Raab Ch.2 31 787 32 898 Soil fertility has been defined as an NCP (see IPBES conceptual framework).

PESC-4: Kristina Raab Ch.2 31 791 32 898 We changed to soil quality which is broader. Soil related NCP involve biological aspects but not only.

Chapter 2.2.1.7.2: what does soil fertility have to do with NOx? In this section, there is more information on chemical/mineral components of soil than on biological aspects and the link to biodiversity and ecosystem services is not highlighted as needed.
This section was essentially rewritten.

NCPs are not only focused on agricultural production but on the many contributions of nature to people. Soil organic carbon is a reasonable proxy for soil fertility [as it contains suitable components including those related to biological activity].

Figure 2.22: unreadable due to too small font and out of focus

All information about values were removed from this NCP section

This section was fully rebuilt with focus on flood and drought as main hazards.

All the information about the flood control have been removed from this NCP section

Concerning flood events it is referred to a period from 1980-2010. After 2010 there were several worse flood events in Germany but also in other countries [e.g. 2011/2013 on rivers Elbe and Durance, 2016 extreme rainfall with pluvial floods above all in South Germany]. If a current status should be provided it is advisable to take these events in account (e.g. in running a period of 1980-2016). In Los 1275 for example the Climate Change information refers to a period up to 2014. But due to the bibliographical reference the authors themselves should consider if the extension of the period could be made.

A mixed trends is now settled for the flood as major hazard of this NCP, with an increase of flood severity and frequency in some parts of the region

This section was markedly shortened and rewritten.

This is unclear how these changes have been related to the capacity for flood control of the watershed.

The chapter is how these changes have been related to the capacity for flood control of the watershed.

This section has been condensed.

This section has been recomposed.

This section was entirely rewritten.

This section was significantly shortened and rewritten.

This section has been fully rebuilt with focus on flood and drought as main hazards.

The importance of the NCP. Finally, the valuation method is not always clearly mentioned.

There’s some scope to shorten the text in this section by focusing more on the NCP aspects rather than the broader contextual descriptions about infrastructure, socio-economics and governance issues.

The NCP is buried in the detail on the hazard.

This section was fully revised with focus on flood and drought as main hazards.

This paragraph is unclear. Which is the message?

This section has been reorganised and rewritten with focus on few hazards.

This section was fully rebuilt with focus on flood and drought as main hazards.

This section was considerably shortened and rewritten.

This section has been fully rebuilt with focus on flood and drought as main hazards.

This section was slightly shortened and rewritten.

This section was fully revised with focus on flood and drought as main hazards.

This section was considerably shortened and rewritten.

This section was considerably shortened and rewritten.

This section has been reorganised and rewritten with focus on few hazards.

This section was reorganised and rewritten with focus on a few hazards.

This section was severely constrained by space.

Unfortunatelly this section don’t include anymore information at this level

The precision is made about central europ were the focus is on the

This section was reorganised and rewritten with focus on few hazards.

This section was fully rebuilt with focus on flood and drought as main hazards.

This section was greatly changed.

This section was condensed and rewritten.

This section was slightly shortened and rewritten.

This section was slightly shortened and rewritten.

This section was considerably shortened and rewritten.

This section was considerably shortened and rewritten.

This section was considerably shortened and rewritten.

There's some scope to shorten the text in this section by focusing more on the NCP aspects rather than the broader contextual descriptions about infrastructure, socio-economics and governance issues.

This section was slightly shortened and rewritten.

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This section was considerably shortened and rewritten.
The introduction of new species should not be the first recommendation, because there is a potential of several unintended consequences of introductions. Rather maintain the genetic variability within native species, including forms adapted to drought, and warmer / wetter climates would be a more resilient solution.

This comment has been removed in the 3rd draft.

The NCP was completely rebuilt and rewritten mainly focusing on floods and drought as regulated hazards. Information on the flood regulation NCP capacity being supported by riparian forest is limited (and does not mean any more) but more generally decreasing trends are reported for densely populated areas where most floodplain landscapes and wetlands have been heavily transformed.

Yes, droughts and floods increase in CA is now mentioned in this section.

Yes, droughts and floods increase in CA is now mentioned in this section.

Yes, droughts and floods increase in CA is now mentioned in this section.

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Yes, droughts in CA is now mentioned in this section.

How does this relate to the capacity of ecosystems to reduce fire hazards?

Fire space availability concern, the number of hazard that are explored in this section was limited to flood, and droughts and few lines about fires, but used is not remaining any more.

Unfortunately CA information about Water quality regulation NCP is still very poor and it was mentioned as a gap of information in the new version.

This section was completely rewritten, with main focus on flood regulation and drought regulation, other hazards such as fire and land slides were much reduced because of section length concerns.

This section was completely rewritten, with main focus on flood regulation (number of fire etc..) so that this hazard part was shortened and rewritten in order to evidence this.

This comment has been removed in the 3rd draft.

We found very few information about regulation capacity and trends about these are few: most ref are about the demand for this hazards regulation (number of the etc.) so that this part was shortened and rewritten in order to evidence this.


what are "The very few manuscripts found for Central Europe" How was the "the few" perceptions of people of the threat of fire managed?...
Surely technological advances in agriculture have been a major influence too?

We have covered this using the example of seafood.

Please add that, in addition, people value the NCPs in many different ways.

This section could be better placed together with flood control.

All contains related to drivers of change have been removed because they are not used to refinement issue awareness. “Finding 5: The knowledge base for decision-making as coastline management is weak, in general.”


The whole subject of ABS and Nagoya Protocol seems to be missing or at least is reflected in a very limited way. The list of material NCPs in Chapter 2.2.2 seems to be limited/incomplete. It seems to be mainly focused on the use of commodities as such food and feed, energy, medicine. What seems to be missing is the use of the genetic resources of such materials which is different for many reasons from using them as commodities. Furthermore, utilization of genetic resources goes beyond medicinal purposes. Many very different sectors benefit from research and development on genetic resources, such as pharma, cosmetics, biofuels, biofuels, plant and animal breeding, food, and feed, but also academic (non-applied) research. All provide important contributions to people. Data of such material contributions from nature are not well covered (if at all) in national economic statistics. Since 1981-1984 seem to briefly mention all of this but do not go into any detail. Also, the focus is again on medicinal plants only.

We considered that to the extent that these contributions are in fact made through the materials themselves they are accounted for in the economic considerations, and where the non-material contributions that come along with production of materials are meant in this comment these are discussed in other parts of Chapter 2.

In this sentence, please elaborate on ... ‘part of our daily life’. Add that material NCPs contribute, among others, to mental and physical health and wellbeing, nutrition, sense of place and sense of community, and artistic inspiration. Because the following sentences discuss economic cycles and accounting quite strongly, it suggests that Material NCPs are about commoditization and ‘economics’. This will provide the reader with a frame that is too limited.

Unfortunately, the author group did not have the expertise to cover this subject in more depth.

We found this would be poor messaging.

We found this would be poor messaging.

We considered that to the extent that these contributions are in fact made through the materials themselves they are accounted for in the economic considerations, and where the non-material contributions that come along with production of materials are meant in this comment these are discussed in other parts of Chapter 2.

This section was rewritten with focus on food and drought regulation. Available and relevant information about this NCP regulation from forest and wetlands and coastal morphology will be supplemented with additional with more concisely in this section. The suggested text is “Teaheal/forests are components of coastal which role as natural barriers against erosion and extreme weather events will only be fulfilled if the integrity of this ecosystem as a whole is respected. The knowledge base for decision-making on coastline management is weak, in general.” Other vital habitats include salt marshes and estuaries, as well as natural wetlands or nature-based solutions all along the coastline for continental ecosystems."

This section was completely re-organized focusing on flood and drought hazards.

We found this would be poor messaging.

The Netherlands:

We found this would be poor messaging.

We found this would be poor messaging.

The agreement in ECA-IPBES regional assessment is to indistinguishly use NCP or ES as preferred. As for the definition of NCP, please see Pascual et al., 2017. “Valuing nature’s contributions to people: the IPBES approach.” Current Opinion in Environmental Sustainability 20, 27.

This section is not what the sentences say. To the contrary, it expresse that there are NCP not covered by economic statistics.
Mark Rounsevell Ch.2 56 1411 50 1480 Per year (all FAOSTAT indicators unless explicitly otherwise stated).

The Netherlands: Achterhoek Ch.2 51 1439 51 1440 A low and decreasing number of milking machines per head of cattle indicates scale enlargement and technical progress — increased capacity of milking robots, to be precise. What has happened, is that in the first decade of the CAP more farmers bought a milking machine. Later on, milking machines became more powerful, meaning that you can manage with fewer milking machines. Also, scale enlargement has taken place throughout (western) Europe. While (for example) previously 200 cows were owned by 6 farmers who all had a milking machine, nowadays 200 cows are owned by one farmer who milks them with just one milking machine. Similar, the lower number of milking machines per head of cattle in CA and EE can mean a larger scale as well as a lower degree of mechanization. This is an procedure that is therefore from reframing from using it.

The Netherlands: Achterhoek Ch.2 51 1441 51 1442 The important reasons are the increased capacity of milking machines, and scale enlargement. See next comment.

The Netherlands: Achterhoek Ch.2 51 1443 51 1444 Why is the time unit of meat production per day?

The Netherlands: Achterhoek Ch.2 51 1447 51 1449 This indicator has been removed.

The Netherlands: Achterhoek Ch.2 51 1446 51 1447 Why is the connection of this paragraph to ES unclear?

The Netherlands: Achterhoek Ch.2 51 1460 51 1461 This section deals with the connection of drivers to the section on the source).

The Netherlands: Achterhoek Ch.2 51 1462 51 1463 We added information that the overexploitation was mostly due to setting of catch limits larger than those scientifically advised. The methodology for this has been slightly elaborated on.

The Netherlands: Achterhoek Ch.2 51 1463 51 1464 This indicator has been removed.

The Netherlands: Achterhoek Ch.2 51 1462 51 1463 This indicator has been removed.

The Netherlands: Achterhoek Ch.2 51 1477 51 1480 The section is only meant to address NCP delivery and not the ecosystem or ecosystem functions making that possible (what is done in chapter 3). In order to be consistent, we have added all new text related to the production model and drivers, what is addressed in chapter 4.

The Netherlands: Achterhoek Ch.2 51 1461 51 1462 It was not always clear.

The Netherlands: Achterhoek Ch.2 51 1444 51 1445 This indicator has been removed because monetary values of NCP are reported in section 2.3.5.2 Monetary values.

The Netherlands: Achterhoek Ch.2 51 1459 51 1460 This part has been removed because monetary values of NCP are reported in section 2.3.5.2 Monetary values.

The Netherlands: Achterhoek Ch.2 51 1452 51 1453 The subject is the existence of catch limits larger than those scientifically advised. The methodology for this has been slightly elaborated on.

Stefan Heiliges (USA) is in "tonnes" this should be corrected throughout.

The Netherlands: Achterhoek Ch.2 51 1476 51 1477 Capacity or use, it is out of context in Section 2.2 and overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IPES / Chapter 2 puts economic value as the sole measure of importance of the NCP. Finally, the valuation method is not always clearly mentioned.

The Netherlands: Achterhoek Ch.2 51 1454 51 1455 All this has been removed.

The Netherlands: Achterhoek Ch.2 51 1457 51 1458 We added information that the overexploitation was mostly due to setting of catch limits larger than those scientifically advised. The methodology for this has been slightly elaborated on.

The Netherlands: Achterhoek Ch.2 51 1452 51 1453 This indicator has been removed.

The Netherlands: Achterhoek Ch.2 51 1451 51 1452 Define "capital stock". What are the NCP implications of this paragraph?

The Netherlands: Achterhoek Ch.2 51 1448 51 1449 ... indicators like the mechanisation of food production in the region in the last decades, or the increased use of agricultural tractors …

The Netherlands: Achterhoek Ch.2 51 1443 51 1444 This information is quite old. Is there more recent data?

The Netherlands: Achterhoek Ch.2 51 1439 51 1440 Is there a connection between the declines in this graph around 1990/01 and those in the cereals graph? Presumably because of the break-up of the USSR?

The Netherlands: Achterhoek Ch.2 51 1445 51 1446 This sentence has been changed.

This indicator has been removed in the current version.
This figure has been removed from the section.

The classification that went to plenary contains "and assistance".

Unfortunately, we did not receive this.

We decided to stick with the FAO sub-regions (1) because this is how data is provided and (2) because it reveals key facts that ECA sub-regions would not create.

This text has been removed and will be proposed to C4.6.

This text has been removed.

This graph has not been replaced as it is based on EUROSTAT data and have been harmonized.

This passage has been removed due to length constraints.

This is a possibility. But we cannot speculate about this claim here unless there are referencable sources to support it.

This graph has not been reapplied as it is based on EUROSTAT data and consistent with other data used.

We decided to stick with the FAO sub-regions (1) because this is how data is provided and (2) because it reveals key facts that ECA sub-regions would not create.

I suggest to merge this section with 2.2.2.2.1.

Graph has been corrected to better reflect Central Asia.

This text has been removed.

Due to the limited space available for each NCP, the issue of trade-offs has been treated more at length in FEW section. Nevertheless the new text mentions this compromise in lines 1366-1367.

This text has been removed.

This text has been removed.

This is a plausible option, but we decided not to choose it because it runs counter to the NCP classification.

Graph has been corrected to better reflect Central Asia.

This text has been removed.

The intensification of forestry production for bio-energy, that includes decisions about how much biomass can be extracted from the forest without compromising other benefits in e.g. Sweden and Finland (e.g. soil carbon storage, soil conservation, biodiversity protection) have been studied in depth, and sustainability criteria may not have been completely settled yet. Please consider references in the Finnish and Swedish literature (e.g. Hämäläinen et al. 2015 Canadian J of Forest Research; Evergetis Epameinondas Evergetis; and here about challenges and trade-offs in Scandinavian forest management: http://www.slu.se/en/Collaborative-Centres-and-Projects/tree-stump-harvesting-and-its-environmental-consequences/).

The graph of Inland Fishery Production can be replaced to the graph which TFGI will provide soon.


This is indeed the case, and the trade-offs of extraction need to be treated in its own right. There has been extensive research in these countries addressing the challenges. http://www.cere.se/documents/wp/CERE_WP2012-5.pdf also Verkerk et al. 2014 Ecosystem Services (for an EU overview).

Please, consider references in the Finnish and Swedish literature (e.g. Hämäläinen et al. 2015 Canadian J of Forest Research; http://www.slu.se/en/Collaborative-Centres-and-Projects/tree-stump-harvesting-and-its-environmental-consequences/).

This is a plausible option, but we decided not to choose it because it runs counter to the NCP classification.

This passage has been removed due to length constraints.

This is a possibility. But we cannot speculate about this claim here unless there are referencable sources to support it.

Please consider references in the Finnish and Swedish literature (see e.g. Hämäläinen et al. 2015 Canadian J of Forest Research; http://www.slu.se/en/Collaborative-Centres-and-Projects/tree-stump-harvesting-and-its-environmental-consequences/).
This sentence is reworked for clarification. This would apply to the case of peat too.

I miss some important products such as: seeds and genetic resources (e.g. for forestry), tree derived fibres, peat (huge importance for horticulture and floriculture)

This is designed as an example of direct use of living organisms for NCP 13 and space constraints prevent the use of other examples.

We like to draw the attention to the information on the search strategy for this part of the assessment... (included now prominently in the new draft)

This is a very valid statement, but beyond the scope of this particular section; perhaps this is relevant to other parts of the assessment

This is the new added text.

This is the idea that nature is a fertile ground for inter- and trans-disciplinary studies, with interest across numerous disciplines including anthropology, ethnology, ethnomedicine, ethnobotany, ethnoveterinary and human medicine and epidemiology, and pharmacology and others (Hoffman & Jager, 2011; Poyyakoppala & Sahu, 2010).

The intersection of biodiversity, health and culture is a fertile ground for inter- and trans-disciplinary studies, with interest across numerous disciplines including anthropology, ethnology, ethnomedicine, ethnobotany, ethnoveterinary and human medicine and epidemiology, and pharmacology and others (Hoffman & Jager, 2011; Poyyakoppala & Sahu, 2010).

This intersection of biodiversity, health and culture is a fertile ground for inter- and trans-disciplinary studies, with interest across numerous disciplines including anthropology, ethnology, ethnomedicine, ethnobotany, ethnoveterinary and human medicine and epidemiology, and pharmacology and others (Hoffman & Jager, 2011; Poyyakoppala & Sahu, 2010).

We like to draw the attention to the information on the search strategy for this part of the assessment... (included now prominently in the new draft)

This is a very valid statement, but beyond the scope of this particular section; perhaps this is relevant to other parts of the assessment

This is the new added text.
The figure is not at a good resolution. The smaller text is quite blurry and not readable in some cases.

Change "particular" into 'particularly'


In general, there are a lot of good references. Even if I am not an expert on this topic, I assume that there must exist a lot of other references too, but they may not have been published in well established scientific publications. For instance I found this "grey" report from Finland, which is a literature survey: Bertalan Galambosi & Kirsi Jokela 2002: Uhanalaisten kääkevien maailman ja viihtyvän kilpailuvälineen (Abstrakt: Market potential and research in cultivation of some endangered medicinal plants. Literature survey). Aino-Juvetävissä 17. IB pp. = 8 appendixes. MTT Agrifood Research Finland. Environmental Research. Ecological Production.

Health Review: Valentina Savo Ch. 2 70 1801 79 Excellent use of these data, very important to retain.

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

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Table 2.9, in the row of Central Asia: change "200 medicinal plants species from forest ecosystems only" into '200 medicinal plant species from forest ecosystems only'.

In the row of Kyrgyzstan: change "200 medicinal vascular species" into '200 species of medicinal vascular plants'.

In the row of Israel change "medical benefit" into 'medicinal use' or 'health benefit'.

Table 2.9, in the row of Turkestan: change "(Pawera, Verner, Termote, Kandakov, & Karabaev, 2016)" into (Pawera et al., 2016).

Table 2.9, in the row of Central Asia: change "(Egamberdieva, Mamadalieva, Khodjimatov, & Tiezzi, 2013) into '(Egamberdieva et al., 2013)'.

In the row of Lithuania change "Over 100 medicinal plants species growing in the forests" into 'Over 100 medicinal plant species growing in forests'.

Adapted

How do you define relevant?

Table 2.8: ECA region national CBD reports mentioning medicinal plants (N=12)." into ''Table 2.8: national CBD reports in the ECA region that mention medicinal plants (N=12)."

According to our review, performed a total of 64 scientific publications in English'.'

References should be considered the stereotype edition of the work: Wellman M (Ed.). 1958. Pedanii Dioscuridis Anazarbei De Materia Medica libri quinque. Vol 3. Berlin. And the latest East with almost 20 centuries of continuous usage that influenced both Roman and Arabic medicinal practice (Evergetis & Haroutounian, 2015; Staub et al. 2016). As fundamental studies provide different estimates of the number of medicinal plants growing (or used) in Europe and Central Asia, but there are no aggregated data available for the entire region'.

In the row of Tajikistan, change "More than 60 varieties of wild-growing medicinal herbs that in one or another form permitted to use by the public health authorities" into 'More than 60 varieties of wild-growing medicinal herbs whose use, in one or another form, is permitted by the public health authorities'.

In the row of Kyrgyzstan, change "More than 200 medicinal plants species used in traditional and official medicine" into 'More than 200 medicinal plant species used in traditional and conventional medicine'.

In the row of Bosnia change "3.406.573 kg of medicinal plants and forest fruit was exported in 2010 only" into 'A total of 3.406.573 kg of medicinal plants and forest fruits was exported in 2010 only'.

Change "Different studies provide different estimates of the number of medicinal plants growing (or used) in Europe and Central Asia, but there are no aggregated data available for the entire region' into 'Geographically the number of studies is highest for the Central European region, with Turkey having the most publications per country (N=17). According to our review, the number of studies is higher in the Mediterranean and Central European region (Turkey is in the Mediterranean)'.

The number of studies is underestimated. We like to draw the attention to the information on the search strategy for this part of the assessment – (included now more prominently in the new appendix)
Adapted Table 2.9, in the row of Uzbekistan: change “600 medicinal vascular species” into ’600 species of medicinal vascular plants’

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix

There is great number of recent studies and evidence for crocus (saffron), which grows or even cultivated in Europe. It may worth it to be mentioned as paradigm here. Below a few (out of the many) recent publications.


There is great number of recent studies and evidence for crocus (saffron), which grows or even cultivated in Europe. It may worth it to be mentioned as paradigm here. Below a few (out of the many) recent publications.

Additional relevant recent publications for 2.2.4.2 (Medicinal plant knowledge- Experimental knowledge and Table 2.20) are provided below for your consideration.


Rewrite the full paragraph. Suggested new text: Among 64 recent studies (2014 – 2017) about medicinal plants, almost half (28) provided information on their pharmacological activity, chemical or genetic characterization (Table 2.30 in Appendix 2.7.3). Several focused on the pharmacological activity of folk medicinal plants (some examples in Table 2.16). Information on the pharmacological activity can be important for local users: see Table 3.1 for some examples.

Additional relevant literature for 2.2.2.4 Medicinal plant knowledge: Traditional medicinal knowledge is given below for your consideration:


Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

A paragraph cannot be constituted by a single sentence (which by the way is too long). Suggested new text: 'In literature, a wide diversity of medicinal plant species are taken into account and a wide range of medicinal uses are identified. According to a recent literature search we found many recent studies (2014 – Feb 2017) focusing on traditional medicine, either in new ethnobotanical studies in which traditional medicinal knowledge holders are

Additional relevant literature is needed. Suggested new text: 'Among 64 recent studies (2014 – 2017) about medicinal plants, almost half (28) provided information on their pharmacological activity, chemical or genetic characterization (Table 2.30 in Appendix 2.7.3). Several focused on the pharmacological activity of folk medicinal plants (some examples in Table 2.16). Information on the pharmacological activity can be important for local users: see Table 3.1 for some examples.

This results in a very rich pharmacopoeias and a profound local knowledge surrounding medicinal plants. Due to the differing traditions the approach towards products of herbal origin is remarkably different from country to country [e.g. J. Mühle, 2013, Payyappillam & Subramanian, 2013] into these transformations resulted in a very rich pharmacopoeias and a diverse local knowledge about medicinal plants. As a result, the diversity in traditions has let to different approaches towards products of herbal origin in various IC-regions [e.g. J. Mühle, 2013, Payyappillam & Subramanian, 2013].

Additional relevant literature will be helpful. Suggested new text: 'Among 64 recent studies (2014 – 2017) about medicinal plants, almost half (28) provided information on their pharmacological activity, chemical or genetic characterization (Table 2.30 in Appendix 2.7.3). Several focused on the pharmacological activity of folk medicinal plants (some examples in Table 2.16). Information on the pharmacological activity can be important for local users: see Table 3.1 for some examples.

Due to the need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

This was a mistake, the wrong table references are used here; will be corrected.

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Health Review: Valentina Savo Ch.2 74 1971 74 1977 Change “focusing on establishing evidence regarding local traditional medicine” into “focusing on the pharmacological activity of some plants used in local traditional medicine” This table is now deleted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 In the line of Saganov it seems that a reference is missing
Health Review: Valentino Savo Ch.2 74 1971 74 1977 Change “structural potential of a medicinal plants used in folk medicine” into “structural potential of medicinal plants used in folk medicine” This table is now deleted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 In the line of Efferth et al., 2016 Change “Focus their review on biopirarcy: the use of biological resources and/or knowledge of indigenous tribes or communities without allowing them...” into “Authors focus their review on biopirarcy, which is the use of biological resources and/or knowledge of indigenous tribes or communities without sharing with them...” This table is now deleted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 From a cultural perspective they point at the potential of cross-cultural ethnobiological for fostering collaboration” into ‘From a cultural perspective, they highlight the potential of cross-cultural ethnobiological research for fostering collaboration” This table is now deleted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 in the line of Mustafa et al., 2015 Change “From a cultural perspective, they highlight the potential of cross-cultural ethnobiological research for fostering collaboration” into “From a cultural perspective, they highlight the potential of cross-cultural ethnobiological research for fostering collaboration” This table is now deleted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 The issue about property rights in the table (Efferth et al. 2016) on medicinal plants and the commercial use of these species could be brought up into the broader discussion about the NCP.
Health Review: Valentino Savo Ch.2 74 1971 74 1977 Change “Arguments for ethnobotanical research” into “Arguments in literature supporting ethnobotanical research”  
Adapted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 Change “in a “gap in documentation of traditional knowledge in Kyrgyzstan” into “Authors highlight a gap in documentation of traditional knowledge in Kyrgyzstan”  
Adapted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 Change “record of biodiversity” into “record of biodiversity”  
Adapted
Health Review: Valentino Savo Ch.2 74 1971 74 1977 From this viewpoint they propose an increase the biodiversity and conservation of medicinal plants’ biodiversity into “They propose an increase biodiversity and conservation of medicinal plants’ biodiversity” This part is well written and organized, the arguments are important and timely. Minor changes and some comments for develop an argument further. This part pertains the text from page 75 to 78. Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.
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The Netherlands: Astrid Hilgers Ch.2 76 1988 76 1993 This paper provides a global-scale overview of demand for medicinal plants: Wolff, S, Schulp, C.E, Kosten, T & Verburg, PH (2017). Quantifying Spatial Variation in Ecosystem Services Demand: A Global Mapping Approach. Ecological Economics, 156, 16-29. Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.
Hanna Shryhan Ch.2 76 1986 76 2003 To short it’s repetition of the information Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.
Health Review: Zorica Bogicevic Ch.2 76 1990 76 1993 Reasons cited for this increased attention have included public desire for affordable health remedies, and a perception that “natural” products are somehow safer and more effective than mainstream medicines. Besides, natural products often provide synergistic action of multiple active compounds, contributing to more than one effect, which is a usually better thing in comparison to a target-specific chemical product (Bogicevic et al. 2006). Bogicevic, Z, Matic, B, Bogicevic, J, Stefancic, M, Vlakovic, J. (2006). Ethnobotanical and herbal medicine in modern complementary and alternative medicine: An overview of publications in the field of I&C medicine 2001-2013. Journal of ethnopharmacology, 181, 182-193. Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.
Adapted
Section 2.2.2.4.3 “Public Health Perspectives” perhaps has a better place in ‘Health (GQOL 2.3.2)’ or in a section on ‘Education and knowledge’ (Q3). As it is, it does not link clearly to the NCP part of the framework. Another suggestion would be to delete the section altogether or integrate it with section on medicinal plant knowledge.

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

Table 2.13 in the line of Chan, 2003; Ekor, 2013. Remove the extra parenthesis.

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

Relatively little is known about the interactions between prescribed and traditional medicines on psychological and physical health.

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The same concept and almost the same sentences are repeated few lines above (1997-2001). There is even the same little mistake in the reference style.

Adapted

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Adapted
The connection between ILK and food security is unclear. Please, explain this.

Gorenflo added but other two not used due to space constraints and maafi

Suggestion accepted

Birding should also be mentioned since it has become the number one hobby in some countries such as UK

We delete this paragraph

Now it is completely reworded

We added wildlife tourism (not only birding) in this list

take into account the importance of open access condictions on recreational use of nature

Evidence and further explanations needed.

Although there may be a correlation between areas people prefer for outdoor recreation and nature, a recent study from the UK showed that the nature (biodiversity) value of sites is not what draws the peoples' choices. Hornigold, K., Lake, I., Dolman, P. (2016). Recreational Use of the Countryside: No Evidence that High Nature Value Enhances a Key Ecosystem Service. This text on guaranteeing food security and health has some overlaps with Section 2.3, especially with text on relations between NCP and GQOL, and/or text on food security and health. In general ILKP is seen as very positive - are there instances of overuse/misuse associated with ILKP in ECA?

There is enough evidence about the role of ILK as a reservoir of knowledge for guarantying food security and health in Europe. This sentence needs to be explained more clearly. In

GFPP values liaison

This information would be useful to include in the SPM (p. 18, R4 151-154) in the context of Section 2.3.2 (Valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that GFPP 2.2 puts too much value on economic value as the sole measure of importance of the NCP. Finally, the valuation methods are not always clearly mentioned.


Evidence and further explanations needed.

This text on guaranteeing food security and health has some overlaps with Section 2.3, especially with text on relations between NCP and GQOL, and/or text on food security and health. In general ILKP is seen as very positive - are there instances of overuse/misuse associated with ILKP in ECA?

Although there may be a correlation between areas people prefer for outdoor recreation and nature, a recent study from the UK showed that the nature (biodiversity) value of sites is not what draws the peoples' choices. Hornigold, K., Lake, I., Dolman, P. (2016). Recreational Use of the Countryside: No Evidence that High Nature Value Enhances a Key Ecosystem Service. This text on guaranteeing food security and health has some overlaps with Section 2.3, especially with text on relations between NCP and GQOL, and/or text on food security and health. In general ILKP is seen as very positive - are there instances of overuse/misuse associated with ILKP in ECA?

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Quality of life is an important psychological experience, yet is not included in this section. Needs to be acknowledged in the introductory para. There is little international empirical evidence to evaluate the relation between biodiversity, health and quality of life (Skevington, 2009), despite good qualitative evidence from cultural case studies. Ref: Skevington S.M.

Finnish Government

Does this overlap with Section 2.1.1 now? Could this be moved more easily. In


The connection between ILK and food security and health has some overlaps with Section 2.3, especially with text on relations between NCP and GQOL, and/or text on food security and health. In general ILKP is seen as very positive - are there instances of overuse/misuse associated with ILKP in ECA?

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The literature and reports consulted do not give us evidence about a double cause; so we cannot add the exploration here.

The figure on PAHR cannot be right considering the populations of Finland and the UK. Furthermore, the very low rates in Finland, and no visitors in the UK in the late 1990’s are suspicious.

The figure 2.50 only refers to protected areas, but we also highlight the role of these ecosystems in providing recreational services. We have removed the data about protected areas to avoid any misunderstanding.

We include this information.

The links between NCP and health is made in section 3. In section3, we include this metadata, but some information about participation in hunting is provided.

We could not find these numbers for all of the countries of the ECA region.

Not applicable in the current version.

The section on ‘urban systems’ (I assume ‘urban green and blue spaces’ would be a more appropriate title) is poorly developed, given that urban green spaces are both in terms of visits and the sector the most important ecosystems for recreational activities at all. Several references are overlooked (e.g. Bouck and Kucharik, 1999) and wrongly cited (Camp-Cavet et al., 2016).


We follow a systematic review for all the NCP with a clear searching string.

Anyway, this is not applicable in the current version.

This is not applicable in the current version because the required shorter information.

The section about food provision refers barely to agro-ecosystems and agricultural landscapes. This distinction would also be useful to identify which are the ecosystems that are most important for the generation for each NCP.

Not applicable in the current version because the wording limitation, we drop this table out.

We do not add the specific names of the countries, but just we refer to the subregions.

Anyway, this is not applicable in the current version.

We have deleted this paragraph.

Following the suggestions of other reviewers and because the wording limitation, we drop this table out.

Following the suggestions of other reviewers and because the wording limitation, we drop this table out.

What about the Black Sea, Caspian Sea and the Eastern Mediterranean?

Because wording limitation, we drop this table out.

Not applicable in the current version.

The contribution of PA to nature-based tourism is mentioned earlier. Suggest to merge to avoid repetition.

We have deleted this paragraph.

The figure of AAVR cannot be right considering the populations of Finland and the UK. Furthermore, the very low rates in Finland, and no visitors in the UK in the late 1990’s are suspicious.

We add the figure properly by the knowledge task force.

The graph of Percentage of area covered by protected areas can be replaced to the graph which T102 provided.

Following the suggestions of other reviewers and because the wording limitation, we drop this table out.

Following the suggestions of other reviewers and because the wording limitation, we drop this table out.

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We have added Finland in this list (Sievänen & Neuvonen 2011).

We follow a systematic review for all the NCP with a clear searching string

The figure os AAVR cannot be right considering the populations of Finland and the UK. Furthermore, the very low rates in Finland, and no visitors in the UK in the late 1990’s are suspicious.

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Not applicable in the current version.

Not applicable in the current version because the wording limitation, we drop this table out.

Not applicable in the current version because the wording limitation, we drop this table out.

We have removed the table! It doesn’t have value for the chapter.

Following the suggestions of other reviewers and because the wording limitation, we drop this table out.

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We have removed the table! It doesn’t have value for the chapter.

The graph of Percentage of area covered by protected areas can be replaced to the graph which T102 provided.

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Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.

Suggestion accepted.
Could these data be tabulated?

Could we clarify what this phase on hunting tourism is general?

In France, hunters are not usually farmers: http://chasse.bipe.fr/#/Portrait

In France, the economic value of hunting is €3.89 Milliards: http://chasse.bipe.fr/#/ChiffresCles

The term “connectedness of people with nature” is cited. I would suggest that connectedness to nature should also be included in the section on NCPs.

In Scandinavia the large amount of complementing areas is the reason for low number of visits in protected areas.

Please consider removing this sentence which refers to economic value and suggest it as an addition to the authors of Section 2.3.5. Because it is not a measure of the status and trend of NCP capacity or use, it is out of context in Section 2.2 and overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IBPS / Chapter 2 uses economic value as the sole measure of importance of the NCP. Finally, the valuation method is not always clearly mentioned.

We clarified in the new version that hunting is explained as part of the NCP, although we acknowledge the possibility of being NCP-food. Besides, this, we could not address the suggestion because we did not find data that distinguished between trophy hunting from hunting for food. We did not find papers or statistic about photographs either.

We now mention which activities can erode the provision of this NCP.

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Mention that in Scandinavia the large amount of complementing areas is the reason for low number of visits in protected areas.

This paragraph on hunting tourism should not start the chapter, as tourism is a minor part of hunting which is mainly conducted by local people as part of their culture. Now this is corrected.


We are adding the suggested references in the supplementary material. Unfortunately we were also requested to edit down the whole chapter, and particularly this section.

Please remove this section which refers to economic value and suggest it as an addition to the authors of Section 2.3.5 (Valuing NCP) or make it less about ‘economy’ and more about NCP use. Because it is not a measure of the status and trend of NCP capacity or use, it is out of context in Section 2.2 and overlaps with information covered in Section 2.3.5 (Valuing NCP). Moreover, other value types (health, diversity & options, security etc.) are not being referred to in this section either, which implies that IBPS / Chapter 2 uses economic value as the sole measure of importance of the NCP. Finally, the valuation method is not always clearly mentioned.

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Ch.2

Good spiritual quality of life can be a potent outcome (Skevington, 2009).

The whole section has now moved to the QoL section under 2.3.3.

Needs a statement here about the need for more empirical evidence on spiritual QoL.

The taste and nutritional value of wild berries is highly appreciated in Nordic countries - the picking is not only for recreational purposes.

"It would be informative to include other biophysical indicator for 'existance value' than protected areas. Habitat provision for native biodiversity and the problems associated with habitat degradation are important questions to take up. Further, this is relevant for the discussion of flows of services because some of the iconic species in Europe (the large 5) migrate, or consider including 'Existence of species and ecosystems' and 'Spiritual and religious experience'.
This is part of the NCP classification, agreed upon by IPBES. The classification is provided and explained in Chapter 1.

In order to show the whole ECA we want to keep the current map size. Western and Central Europe have indeed a relatively low amount of areas.

We decided to keep the table, as we were asked to add total.

We decided to stick to references with empirical facts.

The ES considered in the Ecological Footprint are described in the section. We have considered and are aware of the critique on the method. Within the assessment there is no space for a method critique. We are of the opinion that the indicator can be used for this purpose.

Which of the previously described ES are considered in EF? Is this a scientifically sound indicator? Consider common critiques on EF and evaluate if this indicator is appropriate for this type of assessment.

The ES considered in the Ecological Footprint are described in the section. We have considered and are aware of the critique on the method. Within the assessment there is no space for a method critique. We are of the opinion that the indicator can be used for this purpose.

...should be taken into account... Through the confidence language.

This section deals with the consequences of interregional flows NCPs, which is much needed and highly interesting. The suggestion is to clearly separate and structure the effects into factors (ecosystems & biodiversity), on NCPs, and finally and especially ‘Good quality of life’. The only aspects of QOLs that are now mentioned are distributional equity and lower costs of food. We are aware that we are addressing an interregional flows of NCPs, but nevertheless suggest to touch upon consequences for some QOL categories (Sen-Pascual et al. 2013), especially: Diversity & options, Security and livelihoods among others: political stability, EFP security, being well in harmony with nature.

The reference to distributional equity and to food security should be sufficient here.

This section currently refers to a section on an indicator for the NCP, not specifying any existence value.


We added this.

It could be interesting to compare the relative proportion of studies on marine and terrestrial ecosystem services. This section deals with the consequences of interregional flows NCPs, which is much needed and highly interesting. The suggestion is to clearly separate and structure the effects into factors (ecosystems & biodiversity), on NCPs, and finally and especially ‘Good quality of life’. The only aspects of QOLs that are now mentioned are distributional equity and lower costs of food. We are aware that we are addressing an interregional flows of NCPs, but nevertheless suggest to touch upon consequences for some QOL categories (Sen-Pascual et al. 2013), especially: Diversity & options, Security and livelihoods among others: political stability, EFP security, being well in harmony with nature.

This can unfortunately not be redrawn based on the original data. We had to rely on published literature.

We decided to stick to references with empirical facts.

...should be taken into account... Through the confidence language.

We were asked to include the additional data.

If you want to update with NFA 2016 in data year 2012: The Europe and Central Asia region have a per capita footprint of 4.5 gha/person and per capita biocapacity of 2.9 gha/person (calculations based on 52 countries). For western and central Europe (data for 40 countries) the per capita footprint is 4.6 gha/person, while per capita biocapacity is 2.2 gha/person. For western Europe (17 countries) the per capita footprint is 4.7 gha/person (0.2 gha/person, biocapacity per capita). For central Asia (5 countries), the footprint was 1.2 gha/person while per capita biocapacity was 1.7.

If you want to update with NFA 2016 in data year 2011: per capita values look correct, but I count 52 countries in this aggregation. Same with western and central Europe – I count 40 countries in this aggregation.

Which of the previously described ES are considered in EF? Is this a scientifically sound indicator? Consider common critiques on EF and evaluate if this indicator is appropriate for this type of assessment.

Values used here are outdated and could be updated/expended with the values up to 2012 that have been provided to IPBES for these reports.

We added a sentence that a negative balance between biocapacity and EFP on can be ascribed to interregional flows.

We were asked to include the additional data.

We added this.

We are aware that this section is on interregional flows of NCPs, but nevertheless suggest to touch upon consequences for some GQOL categories (sensu Pascual et al. 2013), especially: Diversity & options, Security and livelihoods among others: political stability, EFP security, being well in harmony with nature.

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We added this.
While climate change was identified as the most frequently mentioned driver based on the literature reviews, this does not necessarily imply that it is the most important in terms of impacts on NCPs. Please explain why you focus here only on IPCC scenarios? Chapter 4 provides an indepth assessment of direct and indirect drivers, making much more driven than climate change evident. Also, chapter 4 covers future trends for these drivers. Please make sure that this is mentioned and well linked.

Answer: As we were extracting information from papers we could only use what authors had used which was entirely IPCC scenarios for climate change. Links to Chapter 4 are included, as well as the reason for the focus on climate and LUC/CC change.

The chapter 2.2.6.3 is unorganized and the line of thought is missing, redundant examples delete or replace to Ch.5

The concept of “relational values” is not well established. Needs to be introduced more profoundly if used in essential role.

A comment has been made at the start that could this analysis be structured around the specific NCP? (e.g. water quality, water amount, flood control, etc)?

This should be noted if the climate modeler is applying a simplistic prediction model, not taking account key mechanisms. In high latitude systems light is a key factor, with onset of spring bloom and with winter dark. The light conditions will not change with climate.

Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia Comments external review second order draft - Chapter 2

Projected % Change in Wheat Yield, under various SRES (2020)

Climate and LULCC change.
We will change the text in order to avoid this contradiction in the section.

Will be addressed in the upcoming energy security sub-section section.

Idem. Reconsider using the term 'good health'.

It would be good to provide a balanced picture about sources of renewable energy, and put bio-fuels in a context of sustainable management.

This paragraph seems to be on flood regulations (and this misplaces here). The link to water availability is not clear.

The Artic case overlaps with chapters 5, 6 and 6. This case will be significantly reduced and kept in box in the contribution to security sub-section of chapter 2.

We will change the text in order to avoid this contradiction in the text.

This section does not give a clear and accurate reflection of the SOC review (WHo and CDB, 2015). The SOC review (WHo and CDB, 2015) covered 10 themes and 4 cross-cutting areas, not three as mentioned in this section.

This text, and due to other priorities we could not follow up on this comment in the new appendix.

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

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Can references for studies in Central Asia be provided here?

It is stated that healthcare systems are struggling due to changing demographics, climate change, etc. Is there (quantitative) evidence of this that could be referenced or given here?

There is not distinct citation about the connection between wild life as a source of medicinal resources. Need to include disease associated with air pollution, current food production systems which are all more generally linked to our disconnect from nature and anthropocentric vision of life.

"is therefore determined by". Put away too strong. (According to some evolutionary theories, e.g. Stress Reduction Theory, the beneficial effects of contact with nature are quite universal.)

This means that differentials in the ways in which some communities (including indigenous and local communities), groups specifically associated with nature (through work, education, recreational activities, tourism) or groups within wider society (e.g. women, people suffering from poverty) experience and interact with biodiversity and ecosystems may also result in differences in the influence of biodiversity and ecosystems on their health status, with the potential for group- or community-specific dependencies and risks.

Diverse diseases of significance in developing countries fall into three categories based on the form of transmission: foodborne (yaws, sycosis, brucellosis, tuberculosis), infectious (avian influenza, rubella), and vector borne (malaria, trypanosomiasis).

"Well-established" confidence term? Is it to be used between brackets? If not, alternative wording should be used.

The narrative here does not reflect the urban European perspective. For example the importance and significance of cultural ecosystem services in urban areas has not been acknowledged in this paragraph. This acknowledgment would make the relevance of this review to urban areas more explicit than it is now. Relevant references include: Kremer, P., Espinosa, T., McPhearson, T., 2015. Advancing the frontier of urban ecosystem services research, Ecosystem Services, 12, 149-151. La Rosa, D., Spyra, M., Inostroza, L., 2016. Indicators for character and frequency of interactions between people or their communities and the natural environment.

A reference or references here is needed (e.g. Denis and James, 2016; Ruokolainen et al., 2016) http://www.sciencedirect.com/science/article/pii/S1618866715001612; DOI: 10.1097/ACI.0000000000000304

The ways in which health status is affected by biodiversity and NCPs is therefore determined by the nature of specific climate, ecological and socio-economic conditions, including the character and frequency of interactions between people or their communities and the natural environment.

This important issue can be assessed by citing more literature if available.

Would be interesting here to provide a couple of examples of research groups, universities, papers, etc. which demonstrate the increasing interest in human health-environment linkages.

In statement that healthcare systems are struggling due to changing demographics, climate change, etc. is there (quantitative) evidence of this that could be referenced or given here?
Keyb issues also include highly sectoralized health at governances and policy levels (See One Health paper - Queennan et al 2017). Cancer, metabolic and immune-associated diseases are also on the rise and should be mentioned here.


The pollution-payer principle may be emphasized, as well as the need for regulations for pharmaceutical industry (concerning wastewater quality and the assessment of ecotoxicity in the drug development).

Section 2.3.1. Non-communicable diseases. This section is divided in three sub-sections: nutrition, access to nature and ecotoxicology. I really miss inclusion of an emerging important topic, namely the links between biodiversity and NCD. It is somewhat unclear whether the linkages between biodiversity and NCD is part of the section on access to nature. It seems that the immune systems is included as health outcome in Table 2.17, but it remains clear what mechanism would underly this health impact (access to nature or exposure to microbial biodiversity?). The possible linkages between microbial diversity and allergies is not discussed in the current text (old friends hypothesis). I suggest to include the linkages between (microbial) biodiversity and NCD in much more explicit way, perhaps as a fourth subsection of 2.3.2.1. In particular as it has been identified as an important knowledge gap on page 145 (microbial biodiversity?). The possible linkages between microbial biodiversity and allergies is not discussed in the current text ('old friends hypothesis'). I suggest to include the linkages between microbial biodiversity and NCD in much more explicit way, perhaps as a fourth subsection of 2.3.2.1. In particular as it has been identified as an important knowledge gap on page 145 (microbial biodiversity?).

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Excellent use of these data; very important to retain.

Would there be a possibility to include a separate subsection stressing the importance of biodiversity-climate-health interlinkages. I think it would really be a big omission and a missed opportunity if this issue is not made more explicit in this chapter.

The lack of consideration of policy making between agriculture and health undermines efforts to overcome ill health among the rural poor and gives short shrift to agriculture’s role in alleviating many of the world’s most serious health problems. Considered here are malaria, pesticide poisoning, AIDS, and diseases transmitted from animals to humans. The important link through food security and nutrition is discussed elsewhere.

The term ‘well established’ (used as a consistent confidence term for this review) is more accurate for this statement, than the term well documented’ (which seems broad and undefined). Consider amending accordingly.

No specific comments to the text but commented on the state of evidence and key messages in the expert consultation for this part, which will feed into the next version of this part.

An issue lacking: not just ‘modern agriculture’, but ‘ALL TYPES OF AGRICULTURE’ (including traditional agriculture in less developed areas, organic agriculture, etc).

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Additional recent studies on edible wild plants of Europe for subchapter 2.3.2.1 Nutrition are provided bellow for your consideration

Wild food plants used in traditional vegetable mixtures in Italy. J Ethnopharmacol. 2016 Jun 5;185:202-34.


The lack of coordination of policy making between agriculture and health undermines efforts to overcome ill health among the rural poor and gives short shrift to agriculture’s role in alleviating many of the world’s most serious health problems. Considered here are malaria, pesticide poisoning, AIDS, and diseases transmitted from animals to humans. The important link through food security and nutrition is discussed elsewhere.


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Out of increasing interest is the role which biodiversity can play in nutrition security towards the concept of “functional food”, supporting dietary health by providing a wide food resource base, diversifying sources of macro- and micro-nutrients, providing opportunities for development of nutraceuticals, and helping to meet nutritional needs in times of social or economic hardship (Bradner et al., 2015).

The term ‘well established’ (used as a consistent confidence term for this review) is more accurate for this statement, than the term well documented’ (which seems broad and undefined). Consider amending accordingly.

The lack of coordination of policy making between agriculture and health undermines efforts to overcome ill health among the rural poor and gives short shrift to agriculture’s role in alleviating many of the world’s most serious health problems. Considered here are malaria, pesticide poisoning, AIDS, and diseases transmitted from animals to humans. The important link through food security and nutrition is discussed elsewhere.

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The phrase ‘widely assessed’ does not seem to be accurate, especially since the statement has only been substantiated by one reference. Either the phrase ‘widely assessed’ needs to be replaced with an accurate phrase, or additional references added. Further references that could be relevant include: MEERA, R.C., SAHOO, H.K., PARI, D.R. and BRANDAR, D.C., 2013. Genetic resources of wild tuberous food plants traditionally used in Sindupalchowk Region, Nepal. Asian Journal of Agronomy, 8, pp. 17-25.

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

The ecotoxicology section would benefit from: 1. Identifying the need to prioritize contaminants and other stressors of concerns within different parts of ECA; and 2. Identify next generation tests employed to understand ecological responses to and functions providing resilience to stressors. Hence, the Advance Outcome Pathway approach (Anday et al. 2012; Environmental Toxicology and Chemistry, ecological genetics (https://eic.epa.gov/epa/public_record/cm/4744ynd=15677) and high resolution chemical profile analysis.

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

The discussion fit in this section on contributions to health (and rather early within this section, 2.3.2)?

Yes, it concerns health relevant research in relation to nature.
not intended as a IPBES confidence term

Martinez Juarez et al. 2015 The impact of ecosystems on human health and well-being: A critical review. J Outdoor Recreation and Tourism. 10;63-69. This study can be added adapted in the new appendix

Not sure what is meant with the comment "...shows THAT there are..." alternative wording should be used.

Please be attention to the bibliography adapted in the new appendix

The whole of section 2.3.2.1.3 could improve with a clear structure and narrative. At the moment the information in this section is provided in the following sub-sections (a) overview of the literature shown in Tables 2.17 and 2.18, then the start of the section ought to overview the literature shown in Tables 2.17 and 2.18, not another set of literature. Second, the studies mentioned in lines 4007-4012, would be collated, evaluated and summarised. Without this synthesis it is difficult to see how one conclusion from one review could reflect the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

The analysis in this section is very good. If some of this (listing references, indicating degree of certainty and regional coverage) could be done to structure other sections, the specific evidence provided would appear less fragmented and would help to produce some synthesis statements. Thanks for the valuable comment; due to a need for drastic downsizing the text, and due to other priorities we could not follow up on this comment in the new appendix

Access to nature: I miss a brief overview of the possible underlying mechanism. Direct effects of access to nature (for mental wellbeing?), indirect effect via physical activity, how does access to nature affect the endocrine system? etc. What is included in the term 'access to nature'? For example, line 4020-4021 discusses reduced heat stress through improved environments and not enough on the mental/emotional/psycho-social/cultural aspects.

Many farmers in developing countries overuse pesticides and do not take proper safety precautions because they do not understand the risks and fear smaller harvests. Making matters worse, developing countries which have strong regulatory systems for dangerous chemicals have restricted or restricted in industrial countries are used widely in developing countries. Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix

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The whole of section 2.3.2.1.3 could improve with a clear structure and narrative. At the moment the information in this section is provided in the following sub-sections (a) overview of the literature shown in Tables 2.17 and 2.18, (b) overview of European projects (line 4017-4020); (c) strength of evidence for specific health outcomes from contact with nature (Table 2.17, lines 4029-4035); (d) attempted explanation of differences in strength of evidence (Table 2.18, Figure 2.71 and lines 4041-4067); (e) negative aspects of ecosystems and health (only touched upon, lines 4068-4072); (f) issues in knowledge (lines 4077-4082); and (g) water bodies (lines 4087-4090). First, if this section is about the literature shown in Tables 2.17 and 2.18, then the start of the section ought to overview the literature shown in Tables 2.17 and 2.18, not another set of literature. Second, the sub-section on gasc jet knowledge (lines 4077-4082) appears rather for ending the section. So, the sub-section on water bodies (lines 4087-4090) seems out of place, and begins the question why were not woodlands mentioned (i.e. even a more common physical and aesthetic element than water bodies)? Third, the attempted explanation of differences in strength of evidence (Table 2.18, Figure 2.71 and lines 4041-4067) needs acknowledging the epidemiological model; even if it then just focuses on the biomod model. Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.
Conclusions of these two (large?) projects?

The conclusions of these two (large?) projects are as follows: [details from the document]

This is a quote.

4538

we will refer to the main report

We will refer to the main report for the main findings and conclusions.

4538

the new appendix

The new appendix includes additional information.

4538

whole health section, we were not able to incorporate this into the new

We were not able to incorporate this into the new appendix due to other priorities.

4538

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

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Table 2.17: Often reviewed greenspace-related health outcomes and their state of evidence as reported in reviews. In all the literature cited systematic reviews? were often reviewed in an ambiguous description; it would be helpful to know how much rigor is applied in this list of reviews. If not systematic reviews, how included?/recommend you only include systematic reviews in this table. Under Reduced psychiatric morbidity you state “Attention” (precursor) – what do you mean? How is attention a precursor of psychiatric morbidity? Do you mean an ambiguous descriptor? In the literature cited, the following points are reviewed: [details from the table].

This table indeed is an informational addition. We have now added the green space / nature inclusion criteria for each review study in table 2.18.

4538

In any review, you do not mean an ambiguous descriptor. In the literature cited, the following points are reviewed: [details from the table].

Thank you for this relevant literature overview. As these sources are not included here, we have added the green space / nature inclusion criteria for each review study in table 2.18.
The section needs proof reading. The sentence beginning on line 4040 doesn't make sense. The references at the end of the paragraph need curtailing. Could the evidence of the links between biodiversity and the various health outcomes be discussed in a bit more detail? I'm not sure this is adequate to provide this detail. Our review of the links between biodiversity spaces and health outcomes also highlighted negative associations: Lovel, R., Wheeler, B. W., Higgins, L. L., Irvine, K. H., & Depledge, M. H. (2014). A systematic review of the health and well-being benefits of biodiversity environments. Journal of Toxicology and Environmental Health, Part B, 17(1), 1-20.

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Adapted instead of adopted

Figure 2.7: The figure and how you approached the review, would be better placed before the outcome of the review, i.e. Table 2.17 RCTs appear at the top of your pyramid, but you need to acknowledge there are real problems in achieving this in natural experiments; working – often – in deprived urban communities is very messy; whilst it’s a nice aim, it’s simply not possible to follow stringent methodological approaches in this populations: i.e. the field of natural experiments is much more messy.

Adapted instead of adopted

This paragraph seems to be weak in terms of adverse effects and counteracting potential adverse effects.

Included in the new appendix

The issue of pollen allergies is raised here but its solution is suggested. How can this issue be dealt with? Are some plant species less allergenic/provoking?

Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

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The combination of nature and blue space has been shown to have positive effects on health and well being compared to one of the spaces alone. Also, waterfalls have positive health effects, see Goelinger et al. (2012), Goodall et al. (2013).

I'm not sure I agree with the statement that all the water/health research originates from toxicology etc. There is now a small but growing body of research on blue spaces, I believe, with the growing attention to the informal economy associated with water features. They may be some generalisable scenarios associated with patterns of development and different landscapes and species communities. This can be through simply host switching by pathogens given population opportunity and in some cases related to changes in the so-called dilution effects with biodiversity trends. Perhaps more important are the artificially generated biological and structural anomalies (genetics and novel habitat e.g. urban environments, design/mobility livestock systems, poultry and highly pathogenic avian influenza). This is closely aligned to theories on resilience and biodiversity. There is an increasing literature on this subject even if it is lacking in absolute proof of concept given its complexity, the evidence is building and mechanistic explanation emerging.

Climate change also affects human and animal health directly and indirectly through its impact on biodiversity. Hosts and pathogens were evolving together in a relatively stable climate but the equilibrium is now changing with vector distribution and behavior and role of evolution of pathogens being much faster than those of host species (Queenan et al. 2017) and of course, human migration and development. This can lead to increased disease emergence or activity in human landscapes. There may be some generalisable scenarios associated with patterns of development and different landscapes and species communities. In Europe it is more likely that animals are exposed to vector hosts via habitat changes associated with patterns of development and different landscapes and species communities. This can be through simply host switching by pathogens given population opportunity and in some cases related to changes in the so-called dilution effects with biodiversity trends. Perhaps more important are the artificially generated biological and structural anomalies (genetics and novel habitat e.g. urban environments, design/mobility livestock systems, poultry and highly pathogenic avian influenza). This is closely aligned to theories on resilience and biodiversity. There is an increasing literature on this subject even if it is lacking in absolute proof of concept given its complexity, the evidence is building and mechanistic explanation emerging.

The threat of displacement and gentrification as a result of tourism and property value increase is also likely much greater for new blue space infrastructure than new green space, especially with the expansion and development of beachfronts. This threat moderates health benefits, especially for lower SES populations.

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For section 2.3.2.2: Perhaps we should theme issue Conservation, biodiversity and infectious disease: scientific evidence and policy implications' compiled and edited by Hilary S. Young, Chelsea L. Wood, A. Marm Kilpatrick, Kevin D. Lafferty, Charles L. Nunn and Jeffrey R. Vincent.

The only reference that might be relevant is... (reference not provided)

The combination of nature and blue space has been shown to have positive effects on health and well being compared to one of the spaces alone. Also, waterfalls have positive health effects, see Goelinger et al. (2012), Goelinger et al. (2013).

I'm not sure I agree with the statement that all the water/health research originates from toxicology etc. There is now a small but growing body of research on blue spaces, I believe, with the growing attention to the informal economy associated with water features. They may be some generalisable scenarios associated with patterns of development and different landscapes and species communities. This can be through simply host switching by pathogens given population opportunity and in some cases related to changes in the so-called dilution effects with biodiversity trends. Perhaps more important are the artificially generated biological and structural anomalies (genetics and novel habitat e.g. urban environments, design/mobility livestock systems, poultry and highly pathogenic avian influenza). This is closely aligned to theories on resilience and biodiversity. There is an increasing literature on this subject even if it is lacking in absolute proof of concept given its complexity, the evidence is building and mechanistic explanation emerging.

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Is this evidence strong or weak?

After reference there is a lose letter 'k'

Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia Comments external review second order draft - Chapter 2

Margarida Simões

Health Review: Emma Goring

Ch.2 143 4106

Ecosystem change AND climate change are risks factors

Health Review: Stefania Paduano

Ch.2 143 4109

Dilution effect and amplification effect e.g. Lao Y, Wu J and Wu X. 2014 Impact of biodiversity and seasonality on Lyme pathogen transmission. Theoretical Ecology and Medical Modeling 9: 1-10

Health Review: Stefania Paduano

Ch.2 143 4113


Health Review: Stefania Paduano

Ch.2 143 4106

Whilst ecosystem change is recognised as a risk factor for disease emergence and spread, a specific role for biodiversity is not always clear. Increasing diversity would significantly affect the pathogen-carrying species only if those would be ideally abundant within the habitat. However, if there were several potential pathogen hosts, the fluctuations of their abundance wouldn’t cause significant changes in disease emergence. But, if there was only one preferred host for a pathogen, the fluctuations of its population will be a significant factor for disease spreading (Popovic and Popovic, 2011). One mechanism by which biodiversity may reduce disease risk is the “dilution effect”, whereby, in ecosystems where hosts of an infectious agent vary in their ability to transmit an infection, increased diversity of potential hosts reduces the risk of disease outbreak. This concept remains controversial, and any such effect is likely highly specific to pathogens and location (e.g. Randolph and Dobson, 2012). However, some evidence for the dilution effect is at least some local contests has been presented from several European studies (e.g. Ruyts et al., 2016; Khalil et al., 2016; Kedem et al., 2014; Bolzoni et al., 2012) Popovic, Z., Popovic S. 2011. Forest Transition and Zoonoses Risk. Encyclopedia of Environmental Health. pp. 803-811. Please consider this publications for the chapter 2.3.2: Reid, W.V., Mooney, H.A., 2016. The Millennium Ecosystem Assessment: Valuing the benefits of biodiversity and ecosystem services. Current Opinion in Environmental Sustainability 18, 40-46.

Health Review: Stefania Paduano

Ch.2 143 4109

Develop Dilution effect as a general model suggesting a positive (meaning decreasing) effect of biodiversity on disease risk. Of course when you add a host to a system of reservoir hosts, this will lead to dilution, but when you add a reservoir host to a system it is not. All depends on which system you look at and whether you consider burden of one disease or total disease burden.

Health Review: Stefania Paduano

Ch.2 143 4111

Could a case study example from one of these European studies be briefly outlined? This would help to fully illustrate the dilution effect concept.

Health Review: Stefania Paduano

Ch.2 143 4111

Is this evidence strong or weak?

Health Review: Stefania Paduano

Ch.2 143 4111

Could a reference or example be provided of a zoonotic disease posing a major public health threat in the ECA region?

Health Review: Stefania Paduano

Ch.2 143 4111

Another reference there is a loose letter ‘Y’
This could be linked to the necessity of maintaining bio / genetic diversity of organisms that generate food.

This is a large statement to make (the health burden of disasters is likely to increase as a result of climate change). I feel that is could be expanded upon and more references provided.

Climate change is mentioned, but only as driver of disaster risks. Really more elaboration on the biodiversity-climate change-health nexus. Both climate change and biodiversity are expected to have an impact on human health. However, they do not operate in isolation from each other. For example: climate change is expected to greatly affect future biodiversity, while many climate mitigation-efforts will adopt nature-based solutions/options. There is an urgent need to account for such biodiversity-climate interlinkages in assessing associated health implications (i.e. biodiversity-health-climate nexus). [Note: see for example the upcoming conference on this issue in Bonn June 27-29; http://www.epa.org.eu/meet/201507/biodiversity-health-climate-change-conference/]

It is unclear why marine cyanobacteria and plant endophytic fungi are selectively mentioned and other sources are overlooked. What about fresh water microalgae for example? Don’t bacteria with known probiotic properties belong to our natural microbial ecosystem? Why only marine bacteria or the endophytes are considered and mentioned here as “natural” source bacteria? The lack of information regarding microbial diversity and contributions of environmental, food grade and commercial microbes in human health in chapter 2 makes it even more difficult to the reader to understand clearly the concept of subchapter 2.3.2.4

Nature based solutions are gaining increasing political support at the European Union level. This needs appropriate acknowledgement in this section. For details https://ec.europa.eu/research/environment/index_en.htm


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Nature based solutions are gaining increasing political support at the European Union level. This needs appropriate acknowledgement in this section. For details https://ec.europa.eu/research/environment/index_en.htm

I'm happy that this section is included but it really needs strengthening. There is an urgent need for integrated, system-based approaches. The Rockefeller Foundation-Lancet Commission on planetary health report, for example, stresses the need for, among others, improve understanding of potential non-linear state shifts in the natural systems underpinning human health, expanding transdisciplinary research activities, integrated surveillance systems.

Health Review: Theofilos Fournidounos

O.H. 2 142 4202 141 4198

Training and investment in developing One health approach is being addressed currently through European funded MEDI (Network for the Evaluation of One Health) as well as development of One health academic courses (One Health Master developed by Royal Veterinary College and London School of Hygiene and Tropical medicine in London). This could be linked to the necessity of maintaining bio / genetic diversity of organisms that generate food.

The sentence ending with Oosterbroek et al. might be improved by Elmberg et al mentioned above. Approaches such as One Health, EcoHealth etc. are mentioned but here I am unsure if these approaches will fit into the claim of new coalitions. I think this paragraph needs to address Commission on planetary health report, for example, stresses the need for, among others, improve understanding of potential non-linear state shifts in the natural systems underpinning human health, expanding transdisciplinary research activities, integrated surveillance systems.

This is a large statement to make (the health burden of disasters is likely to increase as a result of climate change). I feel that is could be expanded upon and more references provided.

We are not in a position to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix.

This is a large statement to make (the health burden of disasters is likely to increase as a result of climate change). I feel that is could be expanded upon and more references provided.
knowledge gaps should be addressed in the knowledge gap section rather than in the middle of some other section. Include this text in section 2.5.

Encouraging people to be more in the wild might increase the risk of spreading disease. However, the true risk might be very limited. Compare this with Elmberg et al. mentioned above. Also consider Health Impact Assessment, which should also identify links, relationships, and inform policy recommendations.

Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia Comments external review second order draft - Chapter 2

We partly improved the knowledge gaps in the appendix, but cannot include it in the new text due to drastic downsizing needs.
What is the rationale of making ‘health equity’ a separate section? This clearly deals with the distribution of non-material NCPs and we might want to reflect on whether this sub-section is moved to Ch1, as part of the introduction to the assessment. To discuss. Maybe absolute numbers are more intuitive.

The health section has now been integrated in the distributive justice section. The structure of section 2.3.4 is problematic. The distinction intra/inter-generational should probably be made upfront (section 2.3.4.1), as this does not only relate to distribution. As we could not assess much on other aspects of justice than distributinal justice for ICA empirically, we decided to keep this structure.

What sort of data is needed? How will this be collected? Who will conduct the research? Who will fund the research? Possible fundingsources would be useful to identify here.

Lower SES populations are also the most vulnerable to being displaced from access to new and improved urban natural infrastructure meant to provide health benefits.

Has this been mentioned before? References?

The section is not about general environm. equity, but on contributions of ecosystems to support equity/prevent unequity, e.g. through removal of non-reproducible diseases.

Brendon Coolsaet
O Ch 2 151 4470 151 4495

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Genetic resources have both material and non-material (information) components, both of which can be public and private.

This section is new but relates to a previous mention of conflict in the FOD, which I suggested should be explained to consider conflict conservation more widely. The section deals with what is termed here as human-wildlife conflict but as pointed out in relation to the FOD, the conflicts referred to here may be defined as conservation conflicts. Indeed, one of the papers cited here refers to a similar conflict in this way. See e.g. Redpath et al. (2013) Understanding and managing conservation conflicts. Trends in Ecology and Evolution 28, 100-109, particularly the section on defining conservation conflicts. Given that this section deals with intragenerational equity and justice, the conflict is not really between people and wildlife but between different groups of people. Letter studies that point to the social context were added from a text that already appeared below.

New section on Human-Wildlife conflicts was written, based on an elaborate review of the literature. An appendix now provides an overview of this literature.

Health equity section seems to be using equity and equality interchangeably. This should be clarified.

We worked on the language and clarity.

This part has been deleted when shortening.

Thanks for the valuable comment; due to a need for drastic downsizing the section, we were not able to incorporate this into the new text

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We worked on the language and clarity.

This part has been deleted when shortening.

Thanks for the valuable comment; due to a need for drastic downsizing the section, we were not able to incorporate this into the new text

The example of ecotourism barely describes issues of procedural equity. I am not sure what its added value is for this section. The procedural aspects should be developed, or it should be moved to the section on distribution.

We had to rely on published data that came out of the systematic review approach. We could only take into account English literature.

We took this into account.

The focus of the section was to link equity/justice to ES. Sentence was added: Within IPBES, this capacity of ecosystems is considered an overarching NCP category (Maintenance of options).

We took this into account.

The example of ecotourism barely describes issues of procedural equity. I am not sure what its added value is for this section. The procedural aspects should be developed, or it should be moved to the section on distribution.

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This section was no longer applicable in the new text

We worked on the language and clarity.
It should probably be noted that in the case of ecotourism, injustice may arise before the actual distribution of potential benefits. Non-material NCPs may be affected through the activity. The valuation part 2.3.5 needs to be made independently without running appendices. We now include monetary valuation.

We deleted the introductory paragraph. We deleted this section because its content was already introduced in chapter 1. We now include this reflection. Due to a need for drastic downsizing, the section was re-written on the basis of new analysis and will be available for external revision. We now try to include different valuation languages of IPBES guidelines.

We deleted this section because it is not applicable as we deleted this section because its content was already introduced in chapter 1. This section was re-written on the basis of new analysis and will be available for external revision. It includes its importance for policy making. We now try to include different valuation languages of IPBES guidelines.

We now include monetary valuation. We now include this reflection. Thanks for pointing it out.

We now include this reflection. This section was re-written on the basis of new analysis and sent for external revision. We now try to include different valuation languages of IPBES guidelines.

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Why are 'membership levels in env and nature organisations' worth nationwide accountings (How do you derive this conclusion from the chapter?)


The considerable limitations of indicators is now acknowledged in the redefined knowledge gap section.

The knowledge gap section now has a full paragraph on the gaps regarding the influence of NCP on quality of life this address this comment.

An additional problem is that the indicators often do not tell what is the contribution of nature exactly.

Little empirical evidence of how NCP can contribute to the different dimensions of QoL. Few researchers in this field are yet aware of the most appropriate multidimensional and multigeneric measures available for this purpose.

Getting a lot too descriptive?

This paper has been removed.

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Getting a lot too descriptive?

This paper has been removed.

Change "Review research: is to summarize comprehensively the investigations on the antiviral activity of Bulgarian medicinal plants from the past three decades" into 'Review research: the study tested in vitro the antiviral activity of chloroform and methanol extracts of the plant'.

Change "Bulgaria (T. Balkan reg) is a country with a history of traditional use in Bulgaria and in other Balkan countries. It is used to prepare herbal teas and other simple preparations" into 'Bulgaria (T. Balkan reg) is a well-known aromatic and medicinal Mediterranean plant that is native in coastal regions of the western Balkan and southern Europe. Pelargonium and lavender is commonly "Commen sage (Salvia officinalis) and Lavender is a well-known aromatic and medicinal plant that is native to the Balkans and is commonly used in the new appendix'.

Change "Armenia (T. Balkan reg) is a country with a history of traditional use in Armenia and in other Balkan countries. It is used to prepare herbal teas and other simple preparations" into 'Armenia (T. Balkan reg) is a well-known aromatic and medicinal Mediterranean plant that is native in coastal regions of the western Balkan and southern Europe. Pelargonium and lavender is commonly "Commen sage (Salvia officinalis) and Lavender is a well-known aromatic and medicinal plant that is native to the Balkans and is commonly used in the new appendix'.

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"Little empirical evidence of how NCP can contribute to the different dimensions of QoL". Few researchers in this field are yet aware of the most appropriate multidimensional and multigeneric measures available for this purpose.

Getting a lot too descriptive?
Thanks for the valuable comment; due to a need for drastic downsizing the whole health section, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix. A sentence has been rephrased to reflect this.

The notion of monetary values proposed in this text is too vague and it gives a false impression of being exhaustive of all monetization approaches. This is a problem as the values proposed are general and may not be relevant where monetization is most useful (e.g. reflecting non-market values in QBA).

In Ch. 2, line 12, it is suggested that in Table 2.A that the values proposed are average values (as opposed to marginal) and that this is the case and the related limitation:

- 3 suggest that a more precise typology of NCP and ecosystems could also help in strengthening the relevance and usefulness of the values proposed

- 4 propose a more detailed discussion of the different types of non-market monetary values;

- 5 suggest that a more precise typology of NCP and ecosystems could also help in strengthening the relevance and usefulness of the values proposed

France

- It is unclear how the approach suggested by the FRES values guide was considered. Please refer to the FRES values guide (Monetary guide regarding different conceptualisation of multiple values of nature and its benefits, including biodiversity and ecosystem functions and services (deliverable 3.10)).

- It would be useful to provide not only a summary of what the data show, but also at least an explanation (explaining the trends outlined in the presented values, thereby also suggesting policy relevant options (data should actually be seen as a means to provide a basis for developing founded options for decision-makers).

- It would be great to make it more explicit what the difference is between nature’s contributions to people vs. nature’s benefits to people (e.g. through referencing to earlier chapters).

- The table presented on the section 2.7.8 related to the Intangible Cultural Heritage of Humanity (UNESCO) is not up to date. In the new appendix, we were not able to incorporate this into the new text, and due to other priorities we could not follow up on this comment in the new appendix. Updated to US English.

- It seems that the literature research protocol did not identify work done by the 28 Member States of the EU and the European Commission in the MAES and the Natural Capital Protocol and thus would affect the repeatability of the analysis.

- It would be useful to provide not only a summary of what the data show, but also at least an explanation (explaining the trends outlined in the presented values, thereby also suggesting policy relevant options (data should actually be seen as a means to provide a basis for developing founded options for decision-makers)).

- The search criteria aimed to identify publications through a systematised search protocol, in the EWI. As a result, we did not pick up all the publications. Including all reports such as the important one listed in the comments, would have meant that we deviated from the search protocol and thus would affect the repeatability of the analysis.
An explanation or explanations would be helpful, why material and non-material NCP tend to have lower non-market values.

It may be helpful to replace the term “traditional” with the term “conventional.” The text would then read “…that extends beyond conventional market-based monetary approaches…”

What is assistance in “Materials and assistance” resources??

It is not clear what is meant by “value points”. A short explanation in the text could be helpful as readers may not be interested in consulting the appendix.

What is a value point? This key term has not been explained anywhere in the additional text, the appendices, or the main chapter 2.

Although the authors made clear what is meant by this statement, I fell that there is no need to comment or justify the use of the median. The median is generally used for skewed distributions. The mean is used for normal distributions. It might be advisable to report the range or max/min than instead in this paragraph.

The reference on Table 2.B is insufficient. References on publications or reports, where these data were highlighted, are needed here.

Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia Comments external review second order draft - Chapter 2

Inge Liekens
Sander Jacobs

The analysis did not delve more deeply into the reasons why values differed. The analysis of the median values should be used throughout table and texts. The mean values in table and texts should not be shown as this means the means are meaningless. (sorry about the word play)

Rather say “differences in the nature and the scope of the NCP” where it could further be explained that values of different nature are assessed through different methods.

The mean is used for normal distributions. It might be advisable to report the range or max/min.

Although the authors made clear what is meant by this statement, I fell that there is no need to comment or justify the use of the median. The median is generally used for skewed distributions. The mean is used for normal distributions. It might be advisable to report the range or max/min.

It was considered important to highlight the range of values - see comment #1

The median values should be used throughout table and texts. The mean values in table and texts should not be shown as this means the means are meaningless.

In this case it is a general comment for the median values shown. In the main text there is a cautious writing on how to interpret the tables, but I think it needs to be expanded. The difference between minimum and maximum values differ much (over one order of magnitude), for less than, say, three studies per NCP it might be statistically unreliable to present a median or mean value that might be used by others as an established fact. These mean and median values might be biased due to few studies and a new additional analysis really might change the value quite a bit. See for example Figure 2A, NCP 1: only these studies, values range 2.18-24.30; it is possible to see something in these data. Clearly, many studies that are needed for a statistically proper evaluation, a threshold level to avoid small number statistics is possible to indicate those NCPs by making the numbers in italic.

At least a reference to a specific Table within the Appendix could be indicated also.

The extension of valuation to include socio-cultural values is a key message from this section, so we believe it is important to advocate it.

The section in market based valuation and Table 2.A are very limited. They only cover some aspects of agricultural based monetary valuations. Further examples from avoided cost, replacement cost, mitigation cost, and from production and income factor approaches could also be included. A range of additional examples would demonstrate the direct economic importance of nature much stronger than a limited range of examples.

The analysis did not delve more deeply into the reasons why values differed. The analysis of the median values should be used throughout table and texts. The mean values in table and texts should not be shown as this means the means are meaningless. (sorry about the word play)

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At least a reference to a specific Table within the Appendix could be indicated also.

The extension of valuation to include socio-cultural values is a key message from this section, so we believe it is important to advocate it.

What about the situation with regard to market based values in the previous section? Any sub-regional differences?

What is assistance in “Materials and assistance” resources??
I only agree partly with this sentence. You need far more information than size of the area and number of persons affected. I would expand the above plea in asking value practitioners to provide more standardized per unit values where the units are clearly specified, suitable for each service and can be related to others. A more detailed proposal in this direction would help the reader to gauge the distribution.

France

Do the values/ha/yr values for fish contribute much to fisheries aquaculture, etc.? For example the North Sea and north Atlantic fisheries, Norwegian salmon aquaculture, or fish. European Oyster reefs? If these are taken into account how this would/does potentially skew per ha calculsations and how is this skewed accounted for? Would a separate calculation for contributions from marine and living resources make sense as a separate sub-section? Are non-Central/Eastern waters fished by Central/Eastern fishing fleets taken into account for these values when the benefit from the ecosystem services originates in non-Central/Eastern waters but benefits the peoples, economies, and industries of ECA?

Michael Heard Snow

Table 2B: Why did you calculate the median here in this table and not in Table 2.A as well? For some NCPs, mean (or median) are calculated based on very small N. Are these valid estimates?

Conrad Schleyer

A full stop is missing after "Western EU"

Data was not available to estimate median values for Table 2a.

Table 2C: It would be useful to insert a brief explanation, why data are missing for certain aspects, such as values for "pollination and dispersal of seeds and other propagules", particularly remembering that the PES has carried out an assessment on pollination, pollinators and food production.

Inge Liekens

András Makrós

Please recommend that assessments of NCP... with 'The evidence reported above suggests that assessments.'

Note mistake (presumably?) in table where Western/Central/Eastern

Oh, I see. It might be interesting to speculate on the reasons and discuss the finding that most values were from Western EU, with very little value evidence from Eastern EU or Central Asia.

Clarification added.

It is felt that there were a wide range of definitions of per person and per ha and therefore we were not able to convert them to a single unified format. So, it would be difficult to provide a precise definition.

Table 2: Number of papers and value points sourced from EWR (2007-2017); this table needs some editing.

The distribution of the value evidence varies for the different NCP. For example, mean and median values differ widely for habitat creation, but are similar for regulation of air quality. Reporting both mean and median allows the reader to gauge the distribution.

The structure of how this additional text will be included in the assessment report is not clear. It is planned to include the text in the missing chapter 2 and place the appendices at the end of the assessment report if this is the case then the important text provided in the "Conclusions" on page 16 (from 286-299) should be placed more prominently in the assessment itself and not in the appendices of the assessment.

The key message from this conclusion is stated in main report.

Thank you for the feedback.

It is felt that it is important to show these data graphs.
| Christian Schleyer | Ch.2 | 17 | 302 | 25 | 302 | Table 8: I assume that there are good reason not to mention the journal names of the studies listed and that this is explained elsewhere. If not, I wonder... Further, umlauts for names like Wätzold or Wüstemann seem to be missing. | This is the data that was directly downloaded from EVRI. This will require a significant amount of work to address. We do not have that time. |
| EU Ole F. Ostermann | Ch.2 | 17 | 302 | 25 | 302 | Table 8: List of studies included in the review sourced from EVRI refers all papers to "Journal" which must be an error when importing from a database. This is the data that was directly downloaded from EVRI. This will require a significant amount of work to address. We do not have that time. |
| Anatoliy Khapugin | Ch.2 | 28 | 0 | 28 | 0 | Within Table in Appendix 2.B., in section Central Europe for publication "Hartel et al., 2014", there is a mistake. "Rumania" should be changed on "Romania" | Thanks for pointing this out. Nevertheless, according with the last agreement in IPBES, we add all the extra references consulted in the whole chapter in other appendix and therefore this appendix has been removed. |