

External review of the second order draft of the land degradation and restoration assessment
1 May - 26 June 2017
Chapter 5

Reviewer Name	Chapter / SPM	From Page (start)	From Line (start)	To Page (end)	To Line (end)	Comment	Response (from Chapter 5)
LI Qingfeng	All Chapters					Overall comments for the Book: 1,there seems too many repetitions in different chapters and sections for the subject matters of definations, descriptions and explaications, etc., of "land degradation and restoration". Although they are necessary for each individual Chapters, it seems a little bit redundance if appearing in the same book. 2, The economical (cost-benefit) analyses, as well as the ecological asesments, behind the "Succesfull stories", should be strenthened, if the stories are more convincing, in paticularly, if the success is backed with big "projects".	Agree, redundat text on LDR definition and approach has been taken out in discussion with other CLAs. The final report has been streamlined as much as possible.
Germany	All Chapters					We urgently request 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 theme are being used throughout the assessment.	Agree, consistency between chapters has been checked in the final report.
Germany	All Chapters					Please ensure that in all chapters information and case-studies are provided from all regions.	Not necessary to have cases from all regions per se, but a certain balance should be aimed at, which we strived to achieve between all 8 chapters.
Germany	All Chapters					We kindly request the co-chairs and chapter authors to ensure that the key findings emerging from each chapter are captured in the key messages of the SPM.	The SPM has been revised based on the updated key findings from the chapters.
Germany	All Chapters					Please include the concept on 'planetary boundaries' in your discussions.	Agree, Planetary bounderies is an interesting discussion point. This point has been explicitly discussed in Chapter 7.
Germany	All Chapters					Ensure that terminologies are used consistently throughout all chapters.	Although it is desirable, consistent terminology is not always possible, given the fact that the reviewed literature is not consistent either, a key characteristic in land degradation literature to use .
Germany	All Chapters					It is appreciated that each chapter starts with an "executive summary" Please ensure that all Figures/Tables have a high resolution quality. A glossary should be included that provides definitions/explanations of the frequently used terms. Each chapter should also start with a list of acronyms/abbreviations used in the chapter. In some Figures and Tables colours have been used to outline status and trends in a regions or a country. It would be very helpful if the same colour is used for a country/region throughout a chapter and preferably throughout all 8 chapters. The term 'NCP' should be used consistently and with the exact wording provided in IPBES-5/1.	All of these elements have been ensured for the final draft of the report, for all chapters.
Germany	All Chapters					Ensure that definitions, facts, figures and trends outlined in the 8 chapters e.g. on the spatial extent of land degradation / the spatial extent of wetland / water / soil / urbanisation / deforestation / wild fires / conflict, etc... are consistent across all chapters.	Although it is desirable consistent terminology is not always possible, given the fact that the reviewed literature is not consistent either, a key characteristic in land degradation literature.to use

						<p>more attention should be paid to the role that the private sector could play, in the SPM and throughout the document. References p.e.1. Levashova 2011 Opportunities and challenges for private sector entrepreneurship and investment in biodiversity, ecosystem services and nature conservation, Opportunities and challenges for private sector entrepreneurship and investment in biodiversity, ecosystem services and nature conservation. 2. Jenkins, Scherr and Inbar 2012 Markets for Biodiversity Services: Potential Roles and Challenges Journal Environment: Science and Policy for Sustainable Development 3. Business for Sustainable Landscapes, an action agenda, Scherr et al 2017, published by Ecoagriculture Partners and IUCN. 4. Scaling Up Investment & Finance for Integrated Landscape Management: Challenges & Innovations, Shames et al 2013, published by Ecoagriculture Partners 5. Finance for One Planet, Leenders and Bor 2016 www.rvo.nl/CoP_FINC 6. Scaling up investments in ecosystem restoration, Policy Brief Netherlands Assessment Agency, Sewell, Bouman, van der Esch 2016 http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2016-scaling-up-investments-in-ecosystem-restoration_2088.pdf 7. Outcome Statement – Global Landscapes Forum: The Investment Case 2016 http://www.landscapes.org/wp-content/uploads/2016/06/GLF-London-Outcomes-v02.pdf</p>	
Astrid Hilgers	All Chapters					Agree, the role of the private sector should be part of Chapt 6 and 8	
Astrid Hilgers	All Chapters					the term NCP should be explained in the SPM and in the beginning of the document	Agree, editorial
						<p>against a baseline is well addressed in the LDR Assessment. However, there is obvious overlap and redundancy as well as some conflicting information between different parts of the assessment on the issue. In the SPM the key message B1 is related to the issue of baselines and it is well elaborated in the second part of the SPM with some text, a figure and a box. The issues covered are clearly referenced to the Chapter 2 where many of the statements are further elaborated and the issue is also well covered in the Executive Summary of Chapter 2. This is appropriate as according to the Scoping Document for the LDR Assessment the Chapter 2 is requested to deal with concepts.</p> <p>The overlap and some conflicting messages can be found from Chapters 1 and 4. While the nature of Chapter 1 is clearly introductory and as such treating the issue of baselines could be well justified, the messages it conveys relative to the SPM and Chapter 2 are conflicting. In the Executive Summary of Chapter 1 the last point reads: "Degradation and restoration are both concepts which require a baseline to be measured (unresolved). (Box 1.1). The types of baselines which can be used are briefly discussed here, and elaborated in Chapter 2." Here the confidence term 'unresolved' is contradictory to the very clear statement in the B1 of the SPM: "[Land degradation] is scientifically measurable (well established). Land degradation can only be measured in comparison to a baseline,....". It seems the confidence statement in the Ch 1 Executive Summary may be incorrect. It is hardly unresolved that a baseline is needed to measure amount of degradation or restoration.</p> <p>Somewhat similar statement is found in the Executive Summary of Chapter 4: "Land degradation takes place in both natural vegetation and on previously transformed land, so choice of an appropriate baseline against which to assess change is important (unresolved)". Again, the choice of confidence term may be incorrect. The statement is that appropriate baseline is important and this is likely to be well established.</p> <p>In the Scoping Document Chapter 4 is requested to deal with status and trends of degradation and restoration. Because status and trends need to be rooted on some baseline to be meaningful (as was</p>	
Finnish Government	All Chapters					The baseline discussion has been clarified in the SPM of the whole LDRA and in the Box.	
Finnish Government	All Chapters					<p>C6. The word instrumental responses used in SPM, Ch 6 and 8 is kind of confusing. Legal responses are considered to be "enabling responses" not in the category of "instrumental responses". This distinction is problematic as legal instruments are also instrumental responses. I would rather say that well functioning legal and governance systems are enabling responses, while specific legal instruments such as environmental impact assessments, legal standards etc are instrumental responses.</p>	These comments are relevant to Chapt 6 and 8, Not relevant for Chapt 7

Caroline van Leenders	All Chapters					<p>I've been working in the financial sector since 2014. I've run a Community of Practice of 15 financial institutions on natural capital in The Netherlands and wrote the eBook Finance For One Planet with lessons and 12 stories from their practice. I'm now involved in helping DG Environment of the EC with moderating a Community of Practice of financials on biodiversity. See http://ec.europa.eu/environment/biodiversity/business/assets/pdf/mission-statement_en.pdf and I'm working on the start of a CoP FIs and sustainable Landscapes in Africa. I see more and more FIs interspersed in biodiversity and investing with a landscape approach. I think it is high time to make financial flows more visible and include private finance more. If you want any details please contact me!</p>	<p>Agree, role of financial sector is important. It has been addressed in the final report, especially in Chapter 6 and 8 (in accordance with the scope). In chapter 5, we also included the discussion on different valuations of ecosystem services.</p>
Virginia Meléndez Ramírez	All Chapters					<p>All the Chapter could start with an introduction and end with the conclusions, you could standardize the chapters + Several images in some chapters can not be seen well</p>	<p>Agree. The formatting has been ensured for the final draft.</p>
Pavlos Tyrologou and María José Rubial (PESP-EFG)	All Chapters					<p>Most of the document is ecology and agricultural orientated but there is a fair amount of water (surface and ground) and mining so there is some geology discussed but not in depth. We also miss a deeper assessment on the contribution of heavy industry in land contamination and degradation and the legal and political instruments in place (or maybe missing) to prevent the land degradation and promote its protection (i.e.: environmental liability directive and/or others)</p>	<p>The final report has been nuanced. The drivers (including the role of heavy industry in land degradation) are addressed in Ch3 and 4 in detail.</p>
IPBES Knowledge and Data Task Force (KD TF)/ Task Group on Indicators (TGI)	All Chapters					<p>This review provides feedback from the IPBES Knowledge and Data Task Force (KD TF) / Task Group on Indicators (TGI) on the use of IPBES core indicators in your assessment. We see potential for inclusion of additional core indicators and for the more consistent use of the standardized visuals provided. For information on core indicators potentially relevant to a given chapter, please see http://www.ipbes.net/indicators (or see the tab named, "core indicators" in this spreadsheet) and check the indicator trend graphs shared by your TSU. For the trends of IPBES core indicator, standardized visualizations should be used as much as possible to ensure the consistency between and within the assessments. The KD TF/TGI aim to follow up with specific recommendations in the near future. In the meantime, do not hesitate to reach out to them through your TSU or the KD TF TSU (ipbes.kdtsu@gmail.com).</p>	<p>Agree we standardized indicators as much as possible, but not all information in literature is expressed in (standard) core indicators.</p>
U.S. government	All Chapters					<p>The role of biodiversity and functioning ecosystems appears to only be seen through a human lens and one that is directly connected to a specific area. Loss of biodiversity and ecosystem function in one area may affect down stream or far removed ecosystems - land degradation in one area may have huge affect in other areas both for biodiversity and ecosystem function (think migratory birds). The document should have a greater focus on the role of land degradation on a wider set of ecosystem functions than currently apparent.</p>	<p>Agree, teleconnections are important. We have added some information on that in Chapter 5, such as secondary and rebound impacts, external impacts/footprints, consequences of trade policies.</p>
José Romero	All Chapters					<p>General: in this report, the two concepts of "land" and "soil" seem to be interchangeable. It would be useful to define both terms in a glossary attached to this report. The definition of both terms should take into account and explain differences and nuances about "what is above ground" and "what is below ground" for land and soil.</p>	<p>Soil (change) is one component of land (changes). A persistent issue in the LDR field that should be resolved to break the deadlock and become targeted and effective again. Operationalizing the definition of LDR requires discussion with CLAs. Tracking changes in land degradation components i.e. soil, land cover, productivity, water holding capacity, biodiversity and ecosystem services, but do not make a value statement in terms of 'land degradation'. The former is part of the scientific domain (detect changes), the latter part of the political domain (assess desirability).</p>
José Romero	All Chapters					<p>General: in this report, the concept of "trade-off" is used in a rather negative sense, while generally a trade-off is a situation reached for the satisfaction of divergent views and interests, which is considered to be a positive solution. We wonder if this rather negative use of trade-off in the report would be correctly translated in the other non-English languages. For example, in French, we would rather think of a happy outcome when a trade-off (e.g. a compromise, a good deal) is done in front of irreconcilable antagonisms. If the use in this report is more in a negative sense, then why not qualify trade-offs as e.g. "harmful". We hope that the English speakers authors understand our point and find a way out to address it in English as well as in the other non-English languages.</p>	<p>Interesting editorial issue. Trade offs are often used as negative statement, but the essence of the LDRA is to show that enforcing one service has consequences for Biodiv and other services. Whether this factual trade off (not judgmental) is considered as negative or positive is not part of the scientific domain (per definition) but of the political domain. It directly relates to comment and response in line 18.</p>

José Romero	All Chapters				General: the use of the uncertainty statements in the Key Messages should follow some logics: either only in the headings, or everywhere in the paragraphs, or not at all in this section, etc. Currently, it is not clear what the rule is and which parts of the statements are accompanied with which uncertainty statement (e.g. if it is in the heading, then the whole paragraph has the same level of uncertainty?).	Agree, confidence statements should be consistent. This has been ensured for the final report.
Australia NFP	All Chapters				<p>There is a lack of clear guidelines and recommendations for policymakers, particularly in the Summary for Policy Makers which is where we would expect to see them. What is really needed is a quick and easy guide to help a range of decision makers develop and implement policies which reflect the latest scientific data which this report should include.</p> <p>o For example, page 3 of Chapter 1, the Executive Summary of the Chapter, claims that the paper, as an assessment of land degradation and restoration, will evaluate, summarize and present the latest evidence to guide decisions. From our reading of the SPM and chapters, there appears to be little guidance for policymakers and decision makers on how to use the latest evidence to develop policy options.</p>	Agree, clear policy guidance on WHAT (package of) measures would support conservation of BES and which don't (chapt 3, 4, 5 and 7) and HOW these measures could be implemented in an effective and efficient manner (instruments, governance in chapt 6 and 8) are still lacking. Chapt 7 provides a set of measures in its Key Messages. These elements have been added to the SPM
Australia NFP	All Chapters				<p>The case studies in the report are not detailed enough in their current state to be broadly applicable, with little information on their outcomes, methods, and successes.</p> <p>o Case studies are frequently repeated across the chapters. More examples including possible applications in different landscapes/areas/political environments would be useful as well as the case studies effectiveness, implementation and any lessons learned. An understanding of the criteria used to rate each case study would be very useful.</p>	Agree, case studies are nice illustrations but seldom generic in nature, take much space at the expense of essential content, and often includes elements of many chapters (logic). The selection of case studies and the logic for the selection of case studies has been now developed and clearly set out in Ch1.
Australia NFP	All Chapters				<p>Lack of consistency throughout the report's chapters, including definitions used for essential concepts.</p> <p>o The report uses a definition of land degradation different to that used by the United Nations Convention to Combat Desertification (UNCCD), the premiere international body overseeing global efforts to address land degradation, desertification and drought. For example, on Page 3 of Chapter 1, in the Executive Summary, the UNCCD definition of land is used, however the UNCCD definition of land degradation is not used in the report. References to the UNCCD would be useful, along with adopting its definitions/glossary for concepts like land degradation, land restoration, etc.</p>	Agree, the UNCCD definition of LD should be mentioned. However, the definition of land degradation for LDRA was set out and approved by IPBES Plenary, and can not be changed.
Australia NFP	All Chapters				<p>The use throughout the report of references which are significantly dated or not consistent throughout the chapters. This makes the assessment appear to have a lack of a clear methodologies which seek to establish the quality and clarity of the evidence base used to make claims throughout the report.</p> <p>o A specific example of both inconsistency in referencing and use of outdated sources occurs on pages 95 and 96 of Chapter 4, and page 38 of Chapter 3. In Chapter 4, the report uses a 2005 Global Forest Resource Assessment to make claims about the extent of forest cover in a number of countries, including Australia. Yet, in Chapter 3, the report uses a much more recent Global Forest Resource Assessment, from 2015, to look at trends in forest cover decline. If there's no way to use the most recent studies/iterations of reports to support claims in the Report, then the reason for using an older report should be made clear.</p>	Agree, we adjusted the reference used to promote consistency, or explain why other sources are used and why they differ.
David González	Ch.5	General			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 have rephrased the first sentence of the second paragraph of section 5.1.1 to emphasize this and included a citation to Pascual et al. 2016.
David González	Ch.5	General			While economic values are not to be prioritized viz-a-viz other types of values (social, health, etc.) it is clear that this is one value dimension that will be sought by many governments. As part of a pluralistic value framing, it is important to not disregard economic values. Economic values would need to be contextualized under the multiple conceptualizations of values approach	We have attempted to increase the examples of economic values wherever possible.
David González	Ch.5	General			(instrumental, relational) and dimensionality of values (social, health, etc.). This could be shown by means of a table which provides key information about the values assessed, including those pertaining to economic values. It is important to make explicit what values are being assessed and identify gaps (e.g., lack of information on some types of values). This should ideally be done in Chapter 5 of the	LDRA in economic terms - as this is a powerful way to communicate with policy makers - we decided early in the writing process to take a much more holistic approach that was inclusive of economic values but was broader. We chose as is reflected in the organization of the chapter impacts of LDRA on aspects of human

David González	Ch.5	General				The MEP will submit further guidance to support the integration of multiple values in all assessments. We advise you to take this guidance into consideration.	Thank you - the guidance was helpful.
Arreola Villa	Ch.5	General				The document reads well, is easy to understand and is a very interesting summary that feels very useful and insightful	Thank you.
Arreola Villa	Ch.5	General				The document needs to provide definitions of well-being, poverty, quality of life, ILK, IPLC	There is a glossary for the whole assessment. I believe all of these terms are covered by it. Regarding poverty, we have also inserted a definitional paragraph as the 2nd paragraph of 5.2
Arreola Villa	Ch.5	General				There is a lack of a conceptual clarification of the different components of ecosystem services: supply, use, demand	We have chosen to emphasize how combinations of ES impact human quality of life. We believe this is a more powerful way to connect nature to human well-being then delving into the difference between supply, use, and demand. In addition, please refer to comment 3 on the framing of LDRA to ecosystem services and NCP.
Arreola Villa	Ch.5	General				Success stories of restoration were very useful and attractive	Thank you
Arreola Villa	Ch.5	General				The choice of relevant questions for ILK is interesting but where do they come from? Is this really the voice of the communities? It is important to document where these come from	We believe this comment was intended for Chapter 1 authors. We have forwarded it to them.
Arreola Villa	Ch.5	General				The executive summary conveys quite well the complexities of the interactions	Thank you
Arreola Villa	Ch.5	General				It might be useful to link more explicitly the indirect drivers underpinning the critical direct drivers of NCPs with references to chapter 4, to avoid leaving the readers with a sense of simplicity. Where should these interlinkages among chapters should be read? How could the SPM could interlink those processes	The revised SPM contains key messages, with links to all relevant sections in the assessment that provides the required appreciation of the underlying complexity.
Arreola Villa	Ch.5	General				The challenge is to show how the work associated to this huge assessment is providing insights beyond the reading of a particular document or a particular chapter	We believe this comment was intended for the assessment as a whole (rather than only Chapter 5). We have forwarded to assessment administrators to share more broadly.
Arreola Villa	Ch.5	General				Maybe each chapter could have a short introduction to make the limits of the chapter very explicitly and the interactions with other chapters	We believe this comment was intended for the assessment as a whole (rather than only Chapter 5). We have forwarded to assessment administrators to share more broadly.
Arreola Villa	Ch.5	General				Food security is tightly linked to demographic change and those links are not clear and does not provide a strong conceptual basis for this chapter	Food security is not meant to be an organising principle for the entire chapter.
Arreola Villa	Ch.5	General				It is important to be able to provide a conceptual framework that would allow to clearly visualize how land degradation affects the supply of certain NCPs and how it affects its demand and thus what are the consequences for the delivery or use of the services and the consequences for people's well being	The overall framework is provided by Pascual et al and Diaz et al. We did not have a mandate in this chapter to develop such a framework.
Arreola Villa	Ch.5	General				There is a major challenge for the last chapter to really integrate the main social ecological processes identified across the previous chapters to provide a panorama that would lead to opportunities	We believe this comment was intended for chapter 8. We have forwarded it to those authors.
Arreola Villa	Ch.5	General				Figure 1.1. is not useful at all. What is really useful is what do different chapters address and how they build understandings from one chapter to other	We believe this comment was intended for chapter 1. We have forwarded it to those authors.
Arreola Villa	Ch.5	General				Food security and degradation and biodiversity loss and cultural erosion: the linkages are not so clear, nor do the role of ILK associated to the different types of management. The pieces seem to be there but not the whole picture	We have attempted to improve these - especially in the food section in the revision. We have also provided evidence for the role of ILK in food security.
Arreola Villa	Ch.5	General				The aim of the chapter should also include intrinsic values beyond anthropocentric instrumental perspectives	It does - please see Section 5.5.9.3: Ecosystem services under diverse approaches to valuation
Arreola Villa	Ch.5	General				How has ILK been explicitly integrated into these documents? Can you make more visible the processes that have led to make such knowledge visible? The document does make a good recognition of the different types of knowledge but does not really make a bridge and integration. Is this enough to have a bottom up impact in IPLCs?	We believe this comment was intended for the assessment as a whole (rather than only Chapter 5). We have forwarded to assessment administrators to share more broadly.
Arreola Villa	Ch.5	General				The political ecology of the processes underpinning poverty may be addressed in Ch4, but here is needed to avoid oversimplistic assessments of the challenges of poverty	Thanks for pointing this out. We have taken great care to avoid oversimplifying the challenges of poverty. Also relevant to this comment is Chapter 2, where the philosophical underpinnings for LDRA is dealt with in great detail.

Arreola Villa	Ch.5	General				with opportunities. This approach is critical to understand the complex feedback loops between degradation and poverty. Here the chapter focuses on poverty only with respect to access to resources but the understanding of complex social ecological processes underpinning these are needed. There seems to be a very simplistic linear understanding of a flow from ecosystems to society. Today we have	bit difficult to respond fully to this comment. However, we believe that the chapter goes well beyond a 'simplistic linear understanding of a flow' of goods between ecosystems and societies. Throughout the chapter we discuss the institutions and social structures that interact with environmental processes in
Arreola Villa	Ch.5	General				The executive summary does not really convey the different voices and perspectives from different stakeholders across contexts. What are the values and needs of this range of stakeholders.	We were unsure whether this comment was intended for Ch5 or not. We have forwarded to assessment administrators to clarify. We have added concluding text to end of food security section that responds to this comment
Arreola Villa	Ch.5	General				At the end of each chapter it would be really useful to provide: 1- key messages, 2- key information gaps	We believe this comment was intended for the assessment as a whole (rather than only Chapter 5). We have forwarded to assessment administrators to share more broadly.
Mahmood Yekeh Yazdandoost	Ch.5	General				· Land degradation will present major public health challenges for resource-dependent human populations, particularly in low and middle income countries;	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				· Meeting the challenges associated with climate change will require land restoration;	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				· Land restoration, biodiversity conservation and public health strategies should consider as an interlinked strategy for sustainable development;	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				· Mainstreaming of land restoration and ecosystem well-being require the use of common metrics and frameworks;	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				· Socio-cultural factors in land restoration;	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				· Cultural issues in land restoration program; and	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				· Co-management effectiveness for land restoration	We interpreted this to be a comment and we believe the Chapter are consistent with these messages
Mahmood Yekeh Yazdandoost	Ch.5	General				This chapter should create visions for: 1-Social capital a link to conservation; 2-Ecosystem services for global transformation; 3-Accountable land governance.	Our chapter is focused on the link between ES and human well-being and provides evidence to support these approaches. Chapter 2 deals with multiple views of conservation, chapter 6 on responses deals with governance matters and chapter 7 and 8 on scenarios and decision-support speaks to the matter of transformation
Marcus Zisenis	Ch.5	General				Methods to reduce speculation and corruption of real estates could be emphasized as possible positive contributions to limit land degradation such as tradeable building rights and community housing up to four floors (e.g. social and ecological garden city projects). The majority of people on earth lives meanwhile in urban agglomerations.	We agree on this mechanism as a driver - however, responses and scenarios to land degradation are covered in Chapter 6 and 7.
UNCCD SPI	Ch.5	General				This chapter is well organised and clearly written, but it needs a new title to indicate its content more clearly.	The chapter title and -scope is predefined, with little opportunity for us to change it.
Steve Prince	Ch.5	General				1. I realize the effects on Ecosystem Services (NCPs) (Ch. 5) may need some brief introduction on the process by which NCP can change, and on its importance as shown by current status and trends. However, these are the topics that, on the basis of the LDRA Scoping, are supposed to be covered in Ch. 3 and 4. For example, most (not all) of the content of Sections 5.1, 5.2, 5.6, 5.7, 5.8. and 5.9 is what I had expected in Ch.5. On the other hand, Sections 5.3.2.4. and 5.3.2.6. contain some text that I would expect in Ch.4. We need to decide whether materials should be rearranged to try to keep the Scoping structure i.e. human drivers and process (Ch.3) and current prevalence, severity and expected future (Status and trends) Ch. 4. I am cautious about suggesting rearrangement between chapters because this Chapter is, in my opinion, very good in content and style. So maybe adding citations to Ch.3 and 4 sections where the topics are also dealt with would be enough.	Thank you for these comments - we've had a number of conversations to ensure alignment and complementarity between chapters. As an outcome, we have moved parts of the text to Ch4 and Ch3. See responses to comments below, for more details.

Steve Prince	Ch.5	General					2. The "Driver" categories of Ch 3 and 4 were supposed to carry through to Ch. 5, to provide cross-disciplinary themes. Since this does not seem to have been done in Ch 5, could a brief section with sub-sections, titled and organized as they are in Chs 3 and 4, be added? These could be short and mainly contain references to the relevant issues in main Chapter.	In the initial skeleton of this chapter, we quickly realised that there are many options to "slice" the drivers-trends-well-being "cube". Initially, we wanted to have this traceability that you refer to, but the paucity of robust causal evidence, and the many interlinked pathways of influence quickly made us walk away from this option. We spent a lot of time with our review editors, and the approach that you see here, is the compromise, agreed-upon structure that best fits what we think our chapter mandate is. We have made links to the drivers from Ch3, but these are in the body text for each of the sections in Ch5.
Steve Prince	Ch.5	General					3. I have noted some of the Sections in Ch. 4 that could be cited here where the same topic is discussed. There are many more.	Thank you - we have added where appropriate.
Astrid Hilgers	Ch.5	General					Schaik, L.G. and Dinnissen, R. (2014), Terra Incognita: land degradation as underestimated threat amplifier, Clingendael Report, The Hague: Netherlands Institute of International Relations Clingendael https://www.clingendael.nl/sites/default/files/Terra%20Incognita%20-%20Clingendael%20Report.pdf	Thank you for this reference. We have included it in section 5.6.1.3 where we deal with the evidence for linking degradation and conflict.
Lisa Kelley	Ch.5	General					I don't think you ever define poverty or livelihoods... do you need to do this? I think so for at least poverty... For example, I love how you define and discuss food security in the opening paragraphs of that section and even accomodate critiques of that definition. Sorry if I missed this above	Thank you for the suggestion. The second paragraph of 5.2 is now a discussion of poverty and its definition.
Lisa Kelley	Ch.5	General					When we think about the drivers of land degradation, is restoration the most important way to address it for policy makers? this was a little frustrating as a policy take home or, to see it centered as THE policy takehome. what about redressing inequitable consumption of wealthier nations, mitigating the political marginality of the food insecure, reforming global trade policy to favor the food insecure vs. corporate interests, etc. Restoration seems to be the new buzz, but it feels to me analogous to top down solutions like PAs, ICDPs, etc. that haven't worked in so many places. I suppose it is built into the chapter you're meant to write so not sure what you can do but if you can center more prominently INEQUITY and potentially reflect on other ways to address land degradation, I think that would be meaningful in differentiatign this from, e.g. World Bank documents.	It is true that some of the focus of the assessment was decided in initial framing, so we need to stay within that framing. There was an initial decision taken that the work would focus on and evaluate restoration to a large degree. However, I think some of your concerns are still covered by the assessment, although perhaps more so in other chapters - chapters 2 and 3 in particular cover underlying drivers more fully than our chapter does (that was intended to mainly focus on effects).
UNCCD SPI	Ch.5	1	1	1	1		Title too many "ands"	We sympathize but the title of the chapter was decided by the scoping document and we can't change it.
Shenggong LI	Ch.5	6	165	76	2922		In the context, environmenatl degradation, ecosystem degradation and land degradation is interchangably used. They may differ from each other.	We have carefully edited the document and replaced environmental degradation with land degradation where appropriate and used the terms together when they are both occuring.
UNCCD SPI	Ch.5	6	165				Whole executive summary needs to be edited! Many grammar mistakes	Thank you for catching the errors - we have revised and carefully edited the executive summary
Shihai LV	Ch.5	6	167	76	2922		The justify align button should be used in the text.	The final document will be professionally edited.
Mahmood Yekeh Yazdandoost	Ch.5	6	169	6	170		Correct.	Thank you - while we have revised the executive summary we have kept this message
UNCCD SPI	Ch.5	6	174	6	174		How can NCP's show a change in composition and amount? Explain	We have rephrased this key point removing the use of composition to make it clearer to the reader about how land degradation changes ecosystem services.
Germany	Ch.5	6	175	6	175		Spell out abbreviations like "ILK" when they are first used in the chapter. After that, the abbreviation should suffice.	We have spelled it out the first time it is used in the executive summary and the first time it is used in the chapter body.
Yazdandoost	Ch.5	6	179	6	180		Correct.	Thank you
Germany	Ch.5	6	183	6	192		This paragraph seems to consider conversion of natural ecosystems into agricultural land as degradation. It should be clarified how the whole assessment deals with this question. See also SPM, page 22, B 1.3.	Conversion is considered degradation in our defintion. A box giving the definition has been added to the SPM and we have added a pargraph giving the definition in the introduction.
Beria Leimona	Ch.5	6	183	6	183		plural sentence	We disagree - the subject is food security which is singular.
Germany	Ch.5	6	184	6	185		Does this sentence mean that agricultural land is per se regarded as degraded? Please also check, how the other chapters dicuss the status of agricultural land.	Conversion is considered degradation in our defintion. A box giving the definition has been added to the SPM and we have added a paragraph giving the definition in the introduction.

Germany	Ch.5	6	190	6	192	The sentence starting with "Connections between food security, land degradation and indigenous peoples' well-being and rights ..." seems to be a key finding. Is well reflected in the currently set of key messages of the summaries for policymakers?	Thanks for the comment. LDR links (directly and indirectly) to food security and indigenous peoples' rights and -wellbeing, are made in SPM Figure 2, where LDR relevance is mapped onto the SDGs; and SPM findings B4, C2, C3, C4 and C5.
K.N.Ninan	Ch.5	6	198			environmental incomes'. Is this term widely used or familiar to policymakers? Please include this in a glossary of terms in the report	The term is defined in the body text following the key message.
K.N.Ninan	Ch.5	6	206	6	207	"...poverty causes environmental degradation'. There is a two way cause effect relationship between poverty and environmental degradation. More poverty leading to more environmental degradation, and more environmental degradation leading to more poverty. Further, one could also use the counter argument to say that affluence also causes environmental degradation.	We agree with this issue discussed in detail in 5.2.2.2. In addition, the issue of consumption/affluence being a driver of degradation is extensively discussed in Chapter 3.
Mahmood Yekeh Yazdandoost	Ch.5	7	211	7	212	Correct.	We interpret this comment to be the reviewer agreeing with the statement and not noting their is an error.
Douglas, Diane	Ch.5	7	218	230	7	Consider that in poorer rural areas often there is no access to formal health care or medicines from pharmacies. Traditional groups often rely upon medicinal plants collected from the forest to treat ailments. By reducing access to the forest, traditional groups can lose access to medicinal plants and have no recourse to other sources of relief or treatment. Additionally, an important source of cultural knowledge may be lost; and in some cases this knowledge could potentially guide pharmaceutical development of thus far "unknown" medicinal plants.	We agree - these points are covered in section 5.4.5
Shenggong LI	Ch.5	7	238	7	240	This message is very hard to follow.	Rephrased to make the message easier to follow.
NFP of China	Ch.5	7	244	7	247	The description of the figures does not match the facts, please remove "China"	We respectfully disagree. Using only the figure in section 5.8.1 to interpret the accuracy of this statement would not be correct, since the distribution of people is not uniform across China. There is ample supporting text in the reference (Mekkonen & Hoekstra 2016) to support this statement.
Shenggong LI	Ch.5	7	252	7	252	"living"-->"living in"	We disagree. As phrased the sentence is grammatically correct.
Shenggong LI	Ch.5	7	254	7	254	"Active"-->"Efficient": Active is not necessary to increase water security	We respectfully disagree. "Active" refers to continuous, pro-active, aware, learning-by-doing water management approaches. We are of the opinion that you can be efficient in water management through one or two interventions, but that would not necessarily be active.
Sandhya Chandrasekharan	Ch.5	8	260	8	262	also large areas being submerged and large scale displacement for dams (nuclear energy, it is possible to argue, can actually be a cleaner alternative to hydroelectric dams. But pro-environment has to be anti-nuclear? The energy issue at the root of sustainable development, so let us talk about the elephant in the room within IPBES and all possible assessments)	Thank you for this comment. We recognise that hydro-power has regional benefits and local costs, and in this regard, it is similar to other centralised energy generation facilities. Our approach was rather to highlight the local-regional trade-off theme to focus on energy access as a means to achieve SDGs, than unpack another example of centralised energy provisions. We therefor expanded on the nuances of energy access in rural areas, and how that affects, and is affected by LDRA.
Shenggong LI	Ch.5	8	264	8	264	"Biofuels increase agricultural commodity prices" depending upon if the cropland is replaced with biofuel land	Thanks for pointing out this dependency. This is indeed a complex matter, and we have included more of the caveats from section 5.7.2.2 in this key message to get some of this uncertainty across.
Sofía Valeria Cortés Calderón	Ch.5	8	265	8	271	There should be mentioned explicitly one part of cultural services conclusion in executive summary. Adding about: "recognize that in some societies, the idea of ownership of nature is deeply problematic as well as avoid a conflation of ethical beliefs and economic beliefs and a framing of "nature as service provider" that is alien to some societies"	This key message in the executive summary does deal with issues of cultural identity. It is not entirely clear from the comment what needs to be added, but we assume it refers to the material in section 5.10 (now 5.9.3), that deals with the conflicts that may emerge from viewing nature as a service provider. The IPBES assessment guidelines relies on ecosystem services as a concept, and for that reason, the key message is here about LDRA - ecosystems and cultural identity. We recognise that there is some contestation around the ecosystem service concept, and for that reason we include an additional reference to section 5.9.3, where this contestation is unpacked in more detail.
Germany	Ch.5	8	267	8	267	Replace "ILPC" with "IPLC".	Thank you. Change made through the document.
Shenggong LI	Ch.5	9	277	76	2922	Cited literature format is not consistent throughout the context	We agree. We have worked to correct and carefully format the references.

Javier Ernesto Cortés Suárez	Ch.5	9	278	9	278	These affirmation should be better explain and sustained because quality of life is relative from one continent to another, as well as from one country to another.	We have added the following sentence: "In the last quarter century alone, the Human Development Index has increased in all regions in the world(Ciara Raudsepp-Hearne et al., 2010), while at the same time the amount of extant wilderness has decreased to less than 25% of the earth's land surface(Watson et al., 2016). "
Steve Prince	Ch.5		281		281	Cite Chapter 3 (Sect 3.6) and Ch.4 (Sect 4.2.8) on climate change issues	We disagree - while we discuss climate change we want to be clear this it not a climate change assessment.
U.S. government	Ch.5	9	284	76	2922	LDRA is defined on page 5 but LDR is used extensively in this chapter (but not defined?). For readability, please do not use LDR as a substitute with "land degradation," "land restoration," or "land degradation and restoration." Please identify the appropriate term and use this consistently across all chapters.	We agree. We have carefully checked the document for consistent use of land degradation and land restoration.
Sandhya Chandrasekharan	Ch.5	9	286	9	290	But is there not a lot of the social and political in chapter 2 and 3 as well? Needs some restructuring perhaps	We disagree. Chapter 2 and 3 provide information on conceptions and perceptions of land degradation as well as drivers while this chapter discuss how LDR impacts important aspects of human well-being
Steve Prince	Ch.5		287		290	See comment on line 1 on human and biophysical drivers from Chs 3 and 4	We have referred to and responded above.
Sofía Valeria Cortés Calderón	Ch.5	9	294	9	296	There is no definition of the term "poor" and explanation about who are considered in this category. We should be careful with the use of the term "poor" which it's written not only in this section but also appears several times in the rest of the chapter. Apart from all the pejorative overtones of that word for some stakeholders, it also reflects a particular vision of some countries and/or groups of people by referring in that way to vulnerable and marginalized people who do not necessarily consider themselves as poor. Hence this is not compressing a global voice, it makes certain voices heard.	We have added a paragraph with a discussion / definition of poverty. It is the second paragraph of 5.2.
Germany	Ch.5	9	299	9	301	It sounds as if these sentences are discussing 'rehabilitation' and not 'restoration'. Check against the definitions provided in chapter 1, page 7, lines 194-197.	According to the IPBES definitions, rehabilitation is incomplete restoration. We changed the sentence to " Restoration can be an effective way of reducing or reversing some, or all, of the effects of land degradation on populations". This allows for an incomplete form of restoration, which is called rehabilitation. Rehabilitation is a subset of restoration, so if we cover all aspects of restoration, then rehab is included.
David González Jiménez	Ch.5	9	310	10	340	All these paragraphs relate to the 'multiple conceptualizations of values' IPBES guide. It would be good to cite at some point either the guide (deliverable 3(d)) or Pascual et al., (2016) <i>Valuing nature's contributions to people: The IPBES approach</i> . COSUST.	Thank you. We have cited Pascual et al. 2016.
Germany	Ch.5	9	312	9	312	Spell out "LDR" as it is being used for the first time.	We have careful searched and dealt with the use of the LDR acronym
Shenggong LI	Ch.5	9	317	9	317	"conversion from forest to agriculture"-->"conversion from forest to cropland or farmland"	Thank you we have clarified this by changing it to production.
Steve Prince	Ch.5		321		322	Maybe cite Prince 2016 (ref below) on the point that "degradation" is not a unitary process - it includes such disparate processes as loss of non-timber forest resources to dust generation in drylands. (Prince, S. D. (2016). Where does desertification occur? Mapping dryland degradation at regional to global scales. In R. Behnke & M. Mortimore (Eds.), In The End of Desertification? Disputing Environmental Change in the Drylands. Springer-Praxis Earth System Science Series.)	While we agree this is a good citation - the sentence is talking about impact not the process so we have decided not to cite this paper.
Peter Elias	Ch.5	10	328	328	328	an decrease' appear to be in error	Thank you. Change made
Peter Elias	Ch.5	10	339	339	339	impacts on' instead of 'impacts of'	Thank you. Change has been made to just "impacts"
Germany	Ch.5	11	368	11	368	Please include the definition of "poverty".	We have included the definition (2nd paragraph 5.2)
Sandhya Chandrasekharan	Ch.5	11	369	11	370	would it be good to get a brief history (say, from 1950) of these fragile lands? What made them so?	That information is better found in chapters 3 and 4 of the assessment: drivers of degradation & status and trends in degradation, respectively.
Germany	Ch.5	11	369	11	407	The sections 5.2 and 5.2.1 seem to be using the terms 'fragile', 'marginal' and 'remote' interchangeably. If this is the case, then please consider aligning the text by using one term. If these terms are not being used interchangeably, then it would be useful to include their respective definitions in a box or in a footnote. It would be useful to use the same term across all 8 chapters.	We have defined the terms 'fragile' and 'remote' in the text (we were not quite using them interchangeably but were following usages of the primary sources). We have removed the use of 'marginal' from 5.2.1
Virginia Meléndez Ramírez	Ch.5	11	369	11	369	e.g. map: https://www.slideshare.net/GRFDavos/nicolas-gerber-the-economics-of-land-degradation-and-the-costs-of-action-versus-inaction	Thank you for this reference. We have included more spatial information in the updated FGD version of the assessment (particularly SPM)

Steve Prince	Ch.5		369		370	Check Ch 3 for agreement on these statistics.	Should be consistent now
Lisa Kelley	Ch.5	11	371	NA	NA	order issue... can you first establish that poor people often differentially depend on agricultural production rather than doing this in the third paragraph down?	Done. Now stated in first sentence of section.
K.N.Ninan	Ch.5	11	376			"environmental incomes are disproportionately important to the rural poor. However this could vary widely across countries and localities. See for example a study by David Pearce which shows wide variations in the share of NTFPs in household incomes across countries in the developing world (CBD Technical Report 4- The Value of Forest Ecosystems, 2001; Ninan et al: The Economics of Biodiversity Conservation-Valuation in Tropical Forest Ecosystems, Earthscan, 2007, and Routledge, 2016, see chapter 4; and Ninan: Non-Timber Forest Products and Biodiversity Conservation, chapter 6, in the book, Conserving and Valuing Ecosystem Services and Biodiversity, Earthscan, 2009 and 2011). Although in proportionate terms NTFPs may constitute a major share of household incomes there are also evidences to show that the rich farmers/classes dependence on forest resources such as biomass is larger in absolute and value terms as compared to the poor. See for example a study from Uttar Kannada district in the western ghats biodiversity hotspot in India which found such evidence (Nadkarni et al: The Political Economy of Forest Use and Management, Sage, 1989)	Thank you - yes, this is a message we wanted to convey. That NTFP use by the poor was often higher in relative terms while being lower in absolute terms.
K.N.Ninan	Ch.5	11	379	11	389	A world bank study on India estimated the annual costs of environmental degradation in India at 5.7 % of GDP annually. (Diagonistic Assessment of Selected Environmental Challenges in India, World Bank, 2013). The study assessed the physical and monetary losses of environmental health and natural resources.	Thank you. We have added this information and citation
Lisa Kelley	Ch.5	11	379	11	385	Can you make clear these are estimates?	Done
Thomas Brooks	Ch.5	11	396	11	406	It would be useful to add a couple of sentences here on the spatial relationship between areas important for biodiversity and those important for NCPs. Global studies include Turner et al. (2012) Global biodiversity conservation and the alleviation of poverty. BioScience 62: 85–92; and Larsen et al. (2012) Conserving critical sites for biodiversity provides disproportionate benefits to people. PLoS ONE 7(5): e36971.	Thank you for the suggestion. We have taken it and have included the Turner reference.
Emmanuelle Quillérou	Ch.5	11	399	11	399	The more recent paper is below but you can simply add the reference to the existing one (more detailed): Barbier EB, Hochard JP (2016) Does Land Degradation Increase Poverty in Developing Countries? PLoS ONE 11(5): e0152973. doi:10.1371/ journal.pone.0152973 Barbier and Hochard have crossed changed in populations with changes in land use state, with broadly 4 types of areas: <ul style="list-style-type: none"> • increasing populations on degrading agricultural land • decreasing populations on degrading agricultural land • increasing populations on improving agricultural land • decreasing populations on improving agricultural land It may be worth to cite them as they quite neatly summarise the different results that have been demonstrated by previous literature. Some of the work undertaken by Nkonya and ZEF related to the ELD Initiative should match this perspective too.	Thank you. We have added this reference.
Peter Elias	Ch.5	11	405	406	406	who or which' to be inserted after 'population'	Thank you; corrected
Shenggong LI	Ch.5	11	407	11	408	"populations living on remote lands"-->"populations living on lower quantity lands":remote lands are not definitely lower quantity lands	You are correct. We have rephrased to remove ambiguity.
Peter Elias	Ch.5	11	412	412	412	spatially correlated 'with'	Thank you; corrected
Wayne Twine	Ch.5	12	414	13	458	Also see: Shackleton, C.M. & Shackleton, S.E. (2006) Household wealth status and natural resource use in the Kat River valley, South Africa. Ecological Economics, 57, 306–317.	Thank you. We have added this reference.
Peter Elias	Ch.5	12	422	422	422	that both that'	Thank you; corrected

K.N.Ninan	Ch.5	12	426			""... poverty may cause degradation and vice versa..." I think this cannot be viewed in isolation and has to be assessed in association with other contributory factors too such as increasing population pressure on fragile resources and areas, neglect of traditional wisdoms and community management of such resources, leading to overharvesting and degradation of ecosystems.	We agree. In this section, we discuss institutions and their role in affecting degradation. Other chapters and sections of this assessment discuss population pressure and cultural factors.
David González Jiménez	Ch.5	12	437	13	487	The whole idea shows how there are multiple values which can often inform different discussions in different ways, hence the relevance of multiple conceptualizations of values in decision making. While values (as measures) may let us know what is the market value of environmental incomes, values (as importance) reflect on the relevance of environmental incomes for different households, equity an distribution. As multiple conceptualizations of values should be included in the chapter, this is a good place to brin in this wording.	Thank you for this suggestion. We have added text earlier in this section that points to the multidimensionality of poverty that we believe highlights some differences in valuation. And we have brought in discussion of the idea of multiple conceptualizations of values elsewhere in the chapter, particularly in 5.1 and 5.9
Wayne Twine	Ch.5	13	459	14	503	Also see: Hunter, L.M., Twine, W. & Patterson, L. (2007) 'Locusts are now our beef': adult mortality and household dietary use of local environmental resources in rural South Africa. Scandinavian Journal of Public Health., 35, 165–74. AND Shackleton, C. & Shackleton, S. (2004) The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. South African Journal of Science, 100, 658–664.	Thank you for these useful references. We have incorporated both into the section.
Carolina Ziehl	Ch.5	13	472	13	487	In this paragraph when talking of "inequality" you compare ecosystem incomes between the rich and the poor and how natural resources that supplement incomes in the poor reduce inequality. I do not consider it to be the same to have monetary income as to have access and rights to natural resources. Although natural resources or environmental incomes can complement the incomes of the communities and allow a harmonious subsistence with their ecosystems and provide the means to improve quality of life, that does not reduce inequality. Moreover, in most cases the extraction of natural resources by the "rich" causes land degradation and therefore reduces the income of natural resources for the poor. This point should also be developed in the paragraph. It is necessary to explain that the income generated from the exploitation of natural resources causes more inequality when it is disproportionate, and also causes land degradation reducing access to natural resources for local communities and those who most need it. This is because the exploitation of natural resources by the rich is generally industrial and not sustainable. The access of natural resources to the poor does not promote, for example, social mobility or does not generate opportunities for their children, or does not allow them access to quality services, education, etc. So how do environmental income reduce inequality? Inequality and poverty remains, it is their quality of life that it is improved. Quality of life, inequality, and poverty are different concepts, linked but not the same.	Thank you for the comment. It is true that monetary income is only one component of a livelihood, and that inequality in resource access is an important issue that is not captured in a measure of inequality of monetary incomes. That said, much of the scholarship that tries to quantify inequality does, out of necessity, use either monetary income or proxies for monetary income. In this paragraph, we are discussing that particular body of scholarship, so we believe our approach here is appropriate. Earlier in the section, we discuss the many different roles in sustaining a household that environmental incomes can take, and we hope we make it clear that many of these roles have little to do with monetary value.
Lucía Almeida-Leñero	Ch.5	13	490	13	491	livelihoods"...and then it states that "they can provide a pathway to escape poverty". I consider this statement not entirely true, or just not the right words. In the literature you provide to support this idea, it does mention that forest or environmental incomes can alleviate poverty, improve livelihoods, and have an equalizing effect (which I don't completely agree with). But as far as saying that it "provides	potentially escape poverty". We did not want to entirely change it, because "pathway to escape poverty" is exactly the kind of phrasing those sources use. Also, in that it says simply that "they CAN provide...", we don't believe it is misleading in any way. In that this is one of three possible effects described by the
Shengong LI	Ch.5	14	503	57	2210	In Figures 5.1,5.6, 5.7, 5.8, 5.9, 5.19, and box 5.9, Captions in the original literaure should be deleted.	Thank you - we are fixing this. Apologies that this hadn't already been done by the previous draft.
U.S. government	Ch.5	14	505			There should likely be an arrow from climate change to changes in land use and cover (since this is also a contributing factor, and the change in ecosystem services would be a secondary effect from the land use change). Changes in land use and cove as well as impacts of climate change likely result in deterioration of ecosystem services - they can also (for some services and in some areas) increase the ecosystem services (e.g. water quality or quantity might improve in some areas). Also, changes in land use and cover might provide beneficial ecosystem services, especially in areas that are seeing change to restore ecosystem functioning. Point being - there is not always (or only) bad coming from change.	We are using this figure as it appears in the original source. Regarding the broader point about land cover change leading to both positive and negative effects, this point is highlighted in the SPM of the entire assessment as well as in the food section (5.3) of this chapter where we point out positive gains in food production that result from land cover change
Lisa Kelley	Ch.5	14	505	NA	NA	Feels strange to me government/governmental support isn't anywhere in this figure	I think the authors of the figure in the original source intended "philanthropic safety net" to be interpreted broadly (i.e. including both governmental and non).

Cantele, Matthew	Ch.5	14	524			unclear	"less clear" appropriate because referring to level of certainty in statment in previous sentence.
Lisa Kelley	Ch.5	15	542	15	554	The tragedy of the commons text has few citations and I think is largely debunked as a dominant theory of resource depletion. You bring up ostrom in 5.2.2.3 but I didn't quite understand why it was a separate section. Can you substantiate comments for both the argument and the critique in this section? 5.2.2.2 Comes across as too weakly cited either way.	Thank you for the suggestion. The fact that it has been to a large extent debunked is what we meant to highlight in the following 5.2.2.3 section. We feel that the level of referencing is sufficient to describe the theory - especially when it is a theory that we do not necessarily want to portray as definitive.
Steve Prince	Ch.5		544		545	Private land-owners in Botswana use the communal areas for grazing first, then move to their own protected areas after the communal land grazing is exhausted. Clearly this has a drastic effect on those whose access to grazing is only the communal lands. P 11 in: Frimpong, K. (n.d.). A Review of the Tribal Grazing Land Policy in Botswana. Pula: Botswana Journal of African Studies, 9(1), 1–16. Retrieved from http://archive.lib.msu.edu/DMC/African_Journals/pdfs/PULA/pula009001/pula009001002.pdf	Thank you. This dynamic and reference have been included.
Shenggong LI	Ch.5	15	561	15	563	"wealthy households in fact degrade more" is not always true. The wealthy households invest more in land restoration in some cases	We agree. The first part of this sentence reads "it has been observed that for certain types of environmental degradation..." which we believe makes clear that we are not saying it is true under all circumstances. The sentence is part of a broader point that poor households have often been blamed for degradation.
Lucía Almeida-Leñero	Ch.5	15	566	15	570	Here again, they come close to talking about the problem of land degradation that can occur at the hands of resourceful owners (but they do not stress this point). Specific examples should be included that can demonstrate this occurs. "Rich" landowners who extract natural resources with high environmental costs and lead to land degradation and even impact the resources of surrounding (poor) communities. Many examples of this type of activity occur in the mining industry. I believe that they can enrich this point with some example of this type.	Thank you for the suggestion. We have highlighted this point further with inclusion of a citation by Frimpong
Peter Elias	Ch.5	16	581	593	593	It may be necessary to also emphasise that land tenure systems especially in developing nations could play significant role in escalating land degradation.	Thank you. We have added a description of the "clearing to claim" dynamic earlier in the section and have further highlighted the role of tenure in this particular paragraph
Shenggong LI	Ch.5	16	581	16	583	Definations or a box for absolute and relative poverty are needed here.	Thank you - more explanatory text has been added
Wayne Twine	Ch.5		594		600	See: Feeny, D., Berkes, F., McCay, B.J. & Acheson, J.M. (1990) The tragedy of the commons: Twenty-two years later. <i>Human Ecology</i> , 18, 1–19.	Thank you. Reference added.
Germany	Ch.5	16	601	16	601	What about rehabilitation and poverty reduction?	We have added text to indicate that these findings refer to both restoration and rehabilitation
Shihai LV	Ch.5	16	604	16	640	Restoration can reduce gender disparities of whom? Animals? Human ? Or both of them?	Humans. We believe that that will be understood by the majority of readers - gender disparities are frequently discussed in academic social science as well as in international policy discourse, and we do not recall ever seeing the term "human gender disparities" used to clarify between animals and humans (e.g. see SDG 5).
Lisa Kelley	Ch.5	16	613	16	614	Citations needed; there are lots in JPS etc, see Kelly, 2011.	Thank you. Citations added
Steve Prince	Ch.5		613		614	An example of antagonism towards the Reserve and poaching from the locals. Gibson, C. C., & Marks, S. A. (1995). Transforming rural hunters into conservationists: An assessment of community-based wildlife management programs in Africa. <i>World Development</i> , 23(6), 941–957. http://doi.org/10.1016/0305-750X(95)00025-8	Thank you for the example. We have added this reference.
Steve Prince	Ch.5		614		614	Delete "effect of worsening poverty".	We disagree with this comment. The effect on poverty is the central point of the sentence.
Virginia Meléndez Ramírez	Ch.5	16	617	16	617	For example, sustainable tourism can provide income to local human communities	Thank you for the example. We now mention tourism in the following paragraph, and also discuss negative impacts on tourism in section 5.5
Shenggong LI	Ch.5	17	625	17	625	"ecosystems post-degradation"-->"ecosystem post-degradation"	Thank you, but we believe the original is correct
Virginia Meléndez Ramírez	Ch.5	17	626	17	626	rehabilitation or restoration?	Both were meant. Wording has been clarified.

Beria Leimona	Ch.5	17	659	18	684	Highlight the concept of Satoyama that brings harmony between nature and human well-being: Takeuchi, K., 2010. Rebuilding the relationship between people and nature: the Satoyama Initiative. Ecological research 25, 891-897.	Thank you; we have added a mention of the Satoyama Initiative here.
Wayne Twine	Ch.5		660		674	For impact of poverty on CPR institutions, see: Campbell, B., Mandondo, A., Nematrandwe, N., Sithole, B., De Jong, W., Luckert, M. & Matose, F. (2001) Challenges to proponents of common property resource systems: Despairing voices from the social forests of Zimbabwe. World Development, 29, 589–600.	Thank you, this is an important reference. We have incorporated it into this section.
U.S. government	Ch.5	18	666	18	674	Restoration should take into consideration the potential productivity of the site for a range of ecosystem services - giving a full picture of the potential human benefits.	Thank you. We have revised the text to incorporate this idea.
Javier Ernesto Cortés Suárez	Ch.5	18	675	18	676	These should clarify that governance between actors (civil society, private and public sector) in a territory, is not always articulated in a institutional way, although this would be the ideal state in order to achieve a goal in a restoration process.	We have noted in this section that the point refers to both formal and informal institutions. We hope this addresses the concern.
Germany	Ch.5	18	681	18	684	Is this example on "reforestation programs that incorporate fallow systems" a good example for a "land sharing" system as discussed in chapter 3? If so, then it could be useful to connect to this section with chapter 3, for instance page 36, lines 1082-1084.	Yes, this would be a reasonable example of that term. We have added a cross-reference.
Emmanuelle Quillérou	Ch.5	18	693	18	693	The report referenced below shows that in most cases, taking a holistic perspective and valuing all types of ecosystem services, including carbon and biodiversity, there exist action scenarios that can lead to improvements measured in monetary terms. Quillérou, E., Thomas, R.J., Guchgeldiyev, O., Ettlting, S., Etter, H., & Stewart, N. (2016). Economics of Land Degradation (ELD) Initiative: Broadening options for improved economic sustainability in Central Asia. Synthesis report. Report for the ELD Initiative from the Dryland Systems Program of CGIAR c/o ICARDA, Amman, Jordan. Accessible : www.eld-initiative.org	Thank you. We have added information from a related ELD report.
Emmanuelle Quillérou	Ch.5	18	694	18	709	You could add a sentence to refer to the paper by Qadir et al below which explores a few options for land rehabilitation and/or mitigation of salt-induced land degradation for agriculture. It has both an agronomic and an economic perspective and shows that it can be cost-effective to take action rather than continue with business as usual (inaction) in a context of salt-induced land degradation. Qadir, M., Quillérou, E., Nangia, V., Murtaza, G., Singh, M., Thomas, R.J., Drechsel, P., Noble, A.D. (2014) Economics of Salt-induced Land Degradation and Restoration. Natural Resources Forum, A United Nations Sustainable Development Journal, 38: 282–295.	Thank you. We have added this reference.
Javier Ernesto Cortés Suárez	Ch.5	18	694	18	709	There should be graphic examples (e.g. photos) than can highlight the importance of these research results.	Thank you for the suggestion. We have several photos in this chapter and we feel the balance is appropriate at present. There are several photos of restoration efforts elsewhere in the Assessment, particularly in Ch6.
U.S. government	Ch.5	18	697	18	700	Recommend not using acronyms you haven't defined in the text. Further, given the need to focus on "final" ecosystem services in non-mapping application contexts to avoid double counting of benefits, it is not clear that there are any ecosystem services in this list of four. Take care in implicitly validating approaches and definitions that may not survive academic scrutiny over time.	"NTFP" changed to "non-timber forest product". Re use of "ecosystem services" to cover the four items in the list, we understand that definitions in this field do change, and that double-counting is a real concern. For our purposes here we are using the definition & framing of Millennium Ecosystem Assessment and we believe that calling these four items "ecosystem services" is consistent with the majority of the literature.
David González Jiménez	Ch.5	18	699	18	699	was copared against the benefits two four ecosystem services' change 'two four'	Thank you; corrected

Carolina Ziehl	Ch.5	19	725	22	831	<p>"overpopulation" is never mentioned. Nevertheless, such topics are very important when we talk about food security. Although it is considered a controversial topic, it should not be avoided just to maintain "political correctness". There is a number of scholars, experts, and general public who strongly believe that population growth and overpopulation are big problems for humanity (for all nations, not just developing countries), specially concerning land degradation and food security, and this topic is not being addressed sufficiently, is not even dealt with regardless of having a consensus. It should not be treated as a taboo topic. A paragraph in this section should address this topic and the different sides of it; some authors point out that classic environmental ethics have avoided to talk about overpopulation (Sagols, 2011), those who do address it just confirm the statement without offering solutions or pathways to work out the problem. One of the issues concerning this topic is that economic monopolies need "consuming masses of people" for their industrial and commercial overproduction (and economic growth); this interests obstruct dialogue and proposed solutions. "Environmental ethics should get rid of the weight of prejudice and admit, without a doubt, the urgency of limiting worldwide population" (Sagols, 2011). Other authors focus on the environmental problems of population growth, like (Barajas y Méndez, 1992) who established that growth in cities as a result of population and development, creates social inequality, reduces peoples livelihoods, pollutes natural resources, exhaust water availability and so on. The same authors say that we can not talk about land degradation and soil degradation without addressing the expansion of the urban area due to population growth. (Rosa-Barry, 1995) sustain that one of the main forces of environmental degradation is a "big and growing population in a territory with limited resources", which causes deforestation, soil erosion, etc. They conclude that a sustainable development is not possible without stabilizing or controlling population growth. More recently, (Kopnina & Washington, 2016) argue the reasons why population growth is ignored or denied in sustainable discussions; they point out that action to address population creates social and economic segregation and is portrayed as "anti-poor", "anti-developing country" or "antihuman". They also say that de-linking demographic factors from sustainability concerns ignores significant global realities and trends that must be taken into account to achieve real sustainability. They also point out that policy documents issued by the United Nation's Sustainable Development Goals do not seriously address</p>	<p>Thank you for the comment. We agree that growing population is a core issue and was discussed in detail by the whole LDR team. In the final SPM issue of population growth is discussed and in the final version of Chapter 2 there is a deep discussion of this 2.2.4.2; 2.3.1.4.</p>
Lucía Almeida-Leñero	Ch.5	19	725	22	831	<p>production on the private sector and politic interests. E.g. The cases of transgenic corn and soy in Mexico, are diminishing the food sovereignty of indigenous communities which practice self-consumption farming, where corn is the centerpiece. Emphasize the existence of perverse interests offering biotechnology solutions to achieve food security, that at the same time have negative effects on food sovereignty, i.e. there are cases where food security antagonizes with food sovereignty. Food biotechnology can positively benefit many people, but its nexus with private and political interests are extremely dangerous. In the end, it can eliminate food security due to the lack of control and environmental vision. E.g. In Asia, the center of origin of rice, the introduction of transgenic rice is endangering indigenous varieties (Yoke-Heong, 2005). This varieties offer a local source of more resilient crops (disease resistance and extreme weather events resistance) due to the genetic diversity. In that sense, the transgenic varieties can cause their extinction in long term (Yoke-Heong, 2005). For Mexico, this kind of problems are very important since it is the biogeographic origin of many crop species and the domestication center of many plants. The 15% of the species consumed as food worldwide have their origin in Mexico (Conabio, 2009). The scientific community and environmental organizations as well, argue that the introduction of genetically modified crops, as corn, attempts against agroecosystems sustainability, produces genetic erosion, and limit the access to seeds, that will be controlled by agro biotechnological multinational companies (Massieu-Trigo et al., 2009). Another example is the case of cotton in Mexico; D&P in cooperation with Monsanto introduced transgenic varieties of cotton (Bt), forcing Mexican farmers to sign contracts that forbid the seed storage for next seasons and to have to demonstrate that the seeds they're using is certified by Monsanto (FAO, 2003-04); this practices are clearly attempting against food sovereignty, genetic variability in traditional crops and cultural practices in agroecosystems, like seed storage. FAO. 2003-04. El Estado Mundial de la Agricultura y la Alimentación. [En línea]. Disponible en <ftp://ftp.fao.org/docrep/fao/006/y5160s/y5160s02.pdf>. Consultado el 19 de Mayo del 2017. Yoke-Heong, C. 2005. Los peligros del arroz transgénico. [En línea]. Disponible en <http://old.redtercermundo.org.uy/revista_del_sur/texto_completo.php?id=2807>. Consultado el 19 de Mayo del 2017. Massieu-Trigo, Y., et al. 2000. Consecuencias de la biotecnología en México: el</p>	<p>We thank the reviewer for this important suggestion. We addressed this comment by adding a comprehensive paragraph on page 22, lines 804-817, explaining the risks associated with GM / transgenic crops and food security/food sovereignty, and included strong references from literature, illustrating the cases of Mexico (corn and cotton) and China (rice).</p>
Virginia Meléndez Ramírez	Ch.5	19	726	19	726	<p>Check: http://www.fao.org/hunger/en/ report 2015</p>	<p>Thank you for the comment - we have included citations to numerous FAO and UN documents related to food security in the Chapter.</p>
Germany	Ch.5	20	747			<p>This Figure has a low resolution quality. Please improve.</p>	<p>We have redesigned and increased the resolution of the figure.</p>

IPBES Knowledge and Data Task Force (KD TF)/ Task Group on Indicators (TGI)	Ch.5	20	747	20		The graph of Percentage of undernourished people can be replaced to the graph which TGI will provide soon	We have redesigned this figure to make it easier to interpret.
Steve Prince	Ch.5		747		750	A bar chart might be easier to follow.	We have redesigned this figure to make it easier to interpret.
Steve Prince	Ch.5		752		752	The following monitoring schemes work at fine spatial and temporal resolutions: The USAID Famine Early Warning System (FEWS Net; https://www.fews.net/ . Brown, M.E., 2008. Famine Early Warning Systems and Remote Sensing Data, Heidelberg: Springer Verlag. And The Global Agriculture Monitoring (GLAM) project http://glad.umd.edu/projects/global-agriculture-monitoring-glam-project	Thanks. We have added some text and referenced Brown with regards to the FEWS NET.
Dan Pennock	Ch.5	20	769	20	769	cultural and productive Specificities - what are specificities? A rare bit of jargon in a very clear chapter.	We replaced specificities by contexts - cultural and productive contexts.
Peter Elias	Ch.5	21	775	775	775	by diverse' and not 'my diverse'	Corrected.
Cantele, Matthew	Ch.5	21	813			Food waste due to poor infrastructure and inadequate transportation networks should perhaps garner more than a passing mention considering the amounts of pre-retail waste in the food system.	We agree - we have rephrased the sentence and add two reference to food waste. However, we note this issue more gets at drivers of LD and is covered in Chapter 3
Lisa Kelley	Ch.5	22	813	NA	NA	This comment is really general to the food security section but can you also talk about how land conversion is often, at least in frontier areas, associated with the commodification of land and labor; it seems to me that it is more generally once food becomes something people buy rather than grow (e.g. where adopting export crops) you have market-induced food insecurity and people become subject not only to the vagaries of climate and ecosystem but the vagaries of global markets (e.g. coffee crisis). I came back to this comment bc you address it later. But I think it should be central here too!	We agree - we have added a sentence directing the reader to Section 5.3.2.5 that discusses Globalization, production conflicts, and socio-economic inequality.
Dan Pennock	Ch.5	22	819	22	820	This value (23%) is very important but the source of it is not clear. In Stavi and Lal (2015) the value is taken from a conference presentation by Lal in 2012, but this is not available on-line. I don't believe such an important value should be taken from a non-peer reviewed source (i.e., Lal's conference presentation).	We agree. Elsewhere in the assessment there is a fuller discussion of metrics of degradation, and in particular it is highlighted that it is problematic to quantify what percentage of land is degraded without specifying exactly what metric is being used. We have removed the sentence from this section because we believe it requires more context to be interpreted appropriately.
Germany	Ch.5	22	819	22	823	Do the figures on global terrestrial land degraded correspond with the facts and figures provided in for instance ch 2? (see also chapter 2, Table 2 on page 19).	They do not conflict with those figures, although they are different sources and point to slightly different metrics. In this chapter, we have used metrics that focus on impact to humans in particular, and the choice of measures in this particular sentence reflects that.

Steve Prince	Ch.5		819		824	Chapter, you could mention the issue and reference Ch 4. The Stavi and Lal 2015 paper figures are based on a UNCCD report and Oldeman, Eswaran, Nachtergae (see refs below). But the Oldeman GLASOD map has been shown to be "of little help" by Sonneveld and Dent 2009 and also by Prince 2016. Also Eswaran et al. 2001, has been shown by Prince 2016 to be of little use. Nachtergae gives an early (2004) review of the available data but dismisses it as unreliable. Maybe add here a summary of Ramankuty et al. 2008 for areas derived from measurements, as opposed to UNCCD lore. Citations: ***** (Prince, S. D. (2016). Where does desertification occur? Mapping dryland degradation at regional to global scales. In R. Behnke & M. Mortimore (Eds.), In The End of Desertification? Disputing Environmental Change in the Drylands. Springer-Praxis Earth System Science Series.) ***** (UNCCD, 2011b. Towards a Land Degradation Neutral World. The Submission of the UNCCD Secretariat to the Preparatory Process for the Rio+20 Conference. http://www.unccd.int/Lists/) ***** (Zero Net Land Degradation A Sustainable Development Goal for Rio+20 To secure the contribution of our planet's land and soil to sustainable development, including food security and poverty eradication. (2012). Retrieved from http://www.unccd.int/Lists/SiteDocumentLibrary/Rio+20/UNCCD_PolicyBrief_ZeroNetLandDegradation.pdf ***** Oldeman, L. R. (1994). The global extent of land degradation. (D. J. Greenland & Land Resilience and Sustainable Land Use. Szabolcs, I., Eds., Land Resilience and Sustainable Land Use. Retrieved from http://library.wur.nl/isric/fulltext/isricu_i26803_001.pdf ***** Eswaran,H.,Lal,R.,Reich,P.F.,2001.Land degradation:an overview.In: Bridges,E.M.,Hannam,I.D.,Oldeman,L.R.,PeningdeVries,F.W.T.,Scherr,S.J.,Sompatpanit,S.(Eds.),Responses to Land Degradation.Proc.2nd International Conference on Land Degradation and Desertification.Oxford Press, KhonKaen. ***** Ramankuty,N.,Evan,A.T.,Monfreda,C.,&Foley,J.A.(2008).Farmingtheplanet:1.Geographic distribution of global agricultural lands in the year 2000. Global Biogeochemical Cycles,22(1),n/a-n/a. http://doi.org/10.1029/2007GB002952 ***** Sonneveld,B.G.,& Dent,D.L.(2009).How good is GLASOD? Journal of Environmental Management, 90(1),274–283. http://doi.org/10.1016/j.jenvman.2007.09.008 ***** Dregne,H.E.,&Chou,N.T.(1992).Global	Thank you. We have removed the "23%" number as it was problematic. We have referred to section 4.2 for a further discussion.
Beria Leimona	Ch.5	22	833	23	876	Food security along tree-cover transitions may be considered beyond changing in land use/cover. Van Noordwijk, M., Bizard, V., Wangpakapattanawong, P., Tata, H.L., Villamor, G.B., Leimona, B., 2014. Tree cover transitions and food security in Southeast Asia. Global Food Security.	We thank the reviewer for this comment. We added a sentence about the ties between tree-cover transitions and food security, with a citation of the suggested article, on page 40 of the revised draft, on section 5.3.3
Steve Prince	Ch.5		840		840	And Chapter 4.	Addressed, cited.
Steve Prince	Ch.5		854		854	Cite Ch.4 Sect 4.3.10 on infrastructure status and trends	Addressed, cited.
Steve Prince	Ch.5		864		864	Rondonia and Acre Brazilian agricultural schemes are a stunning example (Congo too). See brazil ref: *****Soares-Filho, B., Alencar, A., Nepstad, D., Cerqueira, G., Vera Diaz, M. del C., Rivero, S., ... Voll, E. (2004). Simulating the response of land-cover changes to road paving and governance along a major Amazon highway: the Santarem-Cuiaba corridor. Global Change Biology, 10(5), 745–764. http://doi.org/10.1111/j.1529-8817.2003.00769.x	Yes, added, including examples from Brazilian Amazon and Congo. Added additional references also, revised text on pgs 25-26 of the revised document.
Steve Prince	Ch.5		878		895	This is sort of about status and trends; these are Chapter 4 topics. See overall comment on line 1.	While we agree that the status and trends are larger covered in Chapter 4, each Chapter to some extent should standalone - therefore we believe this text provides necessary context for this section.
Javier Ernesto Cortés Suárez	Ch.5	23	882	23	884	There should be graphic examples (e.g. photos) than can highlight the importance of these idea.	The reviewer suggested to add graphs or photos to illustrate that natural vegetation has been replaced by agriculture. This belongs to Ch 3 and CH 4, since it is basic information on status and trends, and should not presented CH 5/ Food security section.
Cantele, Matthew	Ch.5	23	887			As with the pre-retail food waste, consumer food waste in the more developed world could be noted here	We agree food waste is an issue - but we think it is better references above as you suggested in your comment on line 813.
Cantele, Matthew	Ch.5	23	889			The global assessment is pushing the use of the term "telecoupling" to describe this phenomenon	Thank you - we have noted telecoupling as one of the terms used
Australia NFP	Ch.5	23	892	24	898	Please make the below change to the text: <i>According to the Saving Forests at Risk Report, recently published by the World Wildlife Fund (WWF, 2015), 893 170 million hectares of forest could be destroyed by 2030. The main deforestation fronts, which are driving 894 biodiversity loss and land, soil and water degradation, are the Amazon basin, the Congo Basin, East Africa, 895 Sumatra, Greater Mekong, Borneo, New Guinea and Eastern Australia (Figure 5.3).</i>	We have removed this text as it belonged in Chapter 4 - the comment has been passed along as well.

David González Jiménez	Ch.5	24	915	24	917	Can these implications on human well-being be specified?	Addressed. We refer to this mis-match of costs and benefits between land use choices, displacement of impacts of one country to another, and implications for human well-being in Section 5.3.2.3, where we discuss facts and consequences of land use and management intensification.
Steve Prince	Ch.5		919		919	Cite Ch 4, Sect 4.3.5 on non-timber resources.	Thanks. We have added a citation.
David González Jiménez	Ch.5	25	947	25	947	Arnold et al., (Arnold et al., 2011) for Arnold et al. (2011)	Correction made - thanks.
McAfee, Brenda	Ch.5	25	948	25	949	The example where children spent more time in school rather than in the bush to support the statement that the decline in forest food can occur due to a decline in knowledge about its use is weak. Is it assumed that the use of wild foods is not included in the the school curriculum?	Addressed. I included a sentence evidencing that this phenomenon may not be always applicable, and that this may be more likely to happen when school curricula do not include information / knowledge on local foods and related ecosystems. Pg 20 of the revised draft, before Box 5.3
Cantele, Matthew	Ch.5	25	948			I don't think you intend to insinuate that increased education leads to a poor diet but that could be misconstrued from the current passage. Dietary simplification is the result of a range of factors including the relative high costs per calorie of nutritionally rich foods compared to processed foods.	Addressed. I clarified that the disconnect between knowledge of local foods may be intensified by school education among indigenous and local communities, and made this statement more relative, removing the impression that this is a general phenomenon.
Shenggong LI	Ch.5	25	954	26	983	Box 5.3 may be depleted or combined with the context. Repetitive	Addressed. We did not delete the box, since we use the boxes to illustrate main ideas conveyed in the main text with specific examples and case-studies. But we revised and shortened the text in the box, avoiding repetition within this chapter and across chapters in the report.
Shenggong LI	Ch.5	26	993	26	1012	"Animal density" may be better replaced with "grazing intensity"	We agree- change made.
Steve Prince	Ch.5		993		1012	Status and trends - candidate text for transfer to Ch 4. See overall comment on line 1.	While we agree that the status and trends are larger covered in Chapter 4, each Chapter to some extent should standalone - therefore we believe this text provides necessary context for this section.
NFP of China	Ch.5	26	1000	26	1002	The increase in grain yields may be related to a number of factors such as technological improvements, rather than the single factor of fertilizer. The view is one-sided , it is proposed to delete the example of China	We agree -many factors are likely involved and we have rephrased the sentence as such. We have also added an additional references (Ju et al. 2009) <i>that indicates: From 1977 to 2005, total annual grain production in China increased from 283 to 484 million tons (a 71% increase) and the average grain production per unit area increased from 2,348 to 4,642 (a 98% increase). However, synthetic N fertilizer application increased from 7.07 to 26.21 million tons (a 271% increase) over the same period.</i>
Lisa Kelley	Ch.5	26	1013	26	1015	I think this section could benefit from a clear definition of intensification which seems to be connected in particular to an industrial vision of intensification. flagging this particular sentence tho bc it doesn't quite follow from the mounds of evidence that intensification actually hurt livelihoods of the poorest, generally helping the wealthiest. (you bring this up later in the paragraph).	We rephrased this particular sentence to make it less one-sided, and inserted three references into the previous section to add further discussion of the relationship between technological intensification and poverty rates.
Shihai LV	Ch.5	26	1017	26	1017	"is missing" should be changed with "are missing"	The verb is connected to "access" and so the singular is the correct conjugation
K.N.Ninan	Ch.5	27	1022	27	1024	SSA- Is this Sub Saharran Africa ?	We have replaced SSA with Sub Saharran Africa
Lisa Kelley	Ch.5	27	1057	27	1059	could you be more direct and refer to this as dispossession? Dispossession of people dependent on land for industrial investments, etc would seem to me to be one of the biggest ways land degradation and food insecurity are connected but this feels kind of danced around through the wording. see, e.g. Li 2009: their land is needed but their labour is not.	Addressed. We referred to the displacement of small family-based farmers as dispossession of lands and loss of jobs, and added the suggested citation.
Steve Prince	Ch.5		1057		1057	We should agree in all chapters to use the same "units of analysis". This was discussed in detail by the secretariat and CLAs and, in this case, "savanna" was used, not "savannah". Minor point, but we are trying to help policy people.	Thank you we searched and replaced savannah with savanna in the document.

Carolina Ziehl	Ch.5	27	1060	29	1140	When talking about land degradation, other ecological functions that would be lost are those involved with soil respiration and its relationship with the carbon cycle (Schlesinger & Andrews, 2000), vegetal coverage and climate regulation (Raich & Schlesinger, 1992). There is a lot of specialized literature about soil respiration. It is important to talk about this subject and its possible ecological and human wellness implications. E.g. Some studies evaluate the microbial activity in soils as biomarkers of degradation and remediation processes (Pascual et al., 2000; Ros et al., 2003; Sheng et al., 2010). Schlesinger, W. H., & Andrews, J. A. (2000). Soil respiration and the global carbon cycle. <i>Biogeochemistry</i> , 48(1), 7-20. Raich, J. W., & Schlesinger, W. H. (1992). The global carbon dioxide flux in soil respiration and its relationship to vegetation and climate. <i>Tellus B</i> , 44(2), 81-99. Pascual, J. A., Garcia, C., Hernandez, T., Moreno, J. L., & Ros, M. (2000). Soil microbial activity as a biomarker of degradation and remediation processes. <i>Soil Biology and Biochemistry</i> , 32(13), 1877-1883. Ros, M., Hernandez, M. T., & Garcí, C. (2003). Soil microbial activity after restoration of a semiarid soil by organic amendments. <i>Soil Biology and Biochemistry</i> , 35(3), 463-469. Sheng, H. A. O., Yang, Y., Yang, Z., Chen, G., Xie, J., Guo, J., & Zou, S. (2010). The dynamic response of soil respiration to land-use changes in subtropical China. <i>Global Change Biology</i> , 16(3), 1107-1121.	We agree that changes that LD strongly impacts soil respiration and the carbon cycle. However, this topic is more correctly covered in Chapter 4 (especially section 4.2) and numerous IPCC assessments as our focus is on the link to ecosystem services and human well-being rather than changes in ecosystem function.
K.N.Ninan	Ch.5	27	1060	28	1116	One aspect that does not seem to have been covered or adequately discussed in this section is the rising costs and variability of crop production after the green revolution due to several factors such as extension of cultivation to marginal lands and use of energy intensive inputs. Also what about the impacts of other factors like globalisation and WTO on domestic agricultural production and farming. Rising trend of farmer suicides in some states in India esp. in arid and semi arid regions including in Punjab noteworthy for ushering in the green revolution in India in the late sixties, due to their inability to repay loans due to crop failures or non-viability of farming is accentuating the agrarian crisis.	While not covered here - we believe many of these issues are covered in other sub-sections - for example section 5.3.2.5 on globalization, production conflicts and socio-economic inequalities.
Steve Prince	Ch.5		1060		1060	Much of this section is Ch.3 material (processes of degradation) and some Ch.4 (status and trends). See overall comment on line 1.	We agree - we have deleted this section as it is covered elsewhere
Dan Pennock	Ch.5	27	1064	27	1064	The FAO et al (2015) citation is not in the list of citations and hence this cannot be evaluated.	This section has been removed as it is covered in Chapter 4
Lisa Kelley	Ch.5	28	1068	28		Page 28 - Not sure Hansen actually makes the connection to ag expansion? Could be wrong! Maybe Gibbs 2010 tho as the cite for connections between deforestation and ag expansion	Thank you - we have removed this section as it was redundant with Chapter 4 & passed the information to Chapter 4
Steve Prince	Ch.5		1070		1070	Add reference to Ch 4 Sect. 4.2.2.	Thank you - we have removed this section as it was redundant with Chapter 4
Shihai LV	Ch.5	28	1076	28	1077	0.1 and 0.4% of what? A percentage can't be measured separately.	Thank you - we have removed this section as it was redundant with Chapter 4 & passed the information to Chapter 4
Steve Prince	Ch.5		1086		1086	Add reference to Ch.4 Sect. 4.2.1.	Thank you - we have removed this section as it was redundant with Chapter 4
Steve Prince	Ch.5		1091		1091	Add a reference to Ch.4, Sect. 4.2.3.	Thank you - we have removed this section as it was redundant with Chapter 4
Lisa Kelley	Ch.5	29	1142			I still think the role of multinational corporations (rather than or in addition to) nations is important here when we talk about land grabbing and investment-induced dispossession.	We agree - we have added language to indicate the role of the private sector in land grabbing.
NFP of China	Ch.5	29	1161	29	1164	It is a universal question and the causal link here is incorrect. It is proposed to delete the example of China	The direct reference in text to China and the EU as consumers of soy and beef products has been removed from this chapter.
Steve Prince	Ch.5		1179		1179	See: Marselis, S. M., Feng, K., Liu, Y., Teodoro, J. D., & Hubacek, K. (2017). Agricultural land displacement and undernourishment. <i>Journal of Cleaner Production</i> , 161, 619-628. http://doi.org/10.1016/j.jclepro.2017.05.125	Thank you - we have added the citation.
Steve Prince	Ch.5		1224		1224	Large parts of this Section are Ch.4 topics. See overall comment on line 1.	While we agree that this is covered in Chapter 4, each Chapter to some extent should stand alone - therefore we believe this text provides important information on climate change impacts.

K.N.Ninan	Ch.5	31	1238	31	1239	Regarding impact of Climate Change on crop yields in South Asia authors may rely on a more recent study by the Asian Development Bank, 2014: Assessing the costs of climate change and adaptation in South Asia by M.Ahmed and S.Suphachalasai (can be downloaded from the web).Also please mention the assumptions made such as assumed temperature rise and for other climatic parameters, while citing figures on expected declines in crop yields.	Thank you - we have added the reference and add info on the specific climate change scenario
Virginia Meléndez Ramírez	Ch.5	32	1269	32	1269	For more information, check: http://www.fao.org/3/a-i6030e.pdf 2016	Addressed, citation added.
Javier Ernesto Cortés Suárez	Ch.5	32	1273	32	1273	There should be more graphic examples (e.g. photos) than can highlight the importance of this topic.	Thank you for the suggestion. On balance, we have decided that the number of figures and illustrations in the current draft is appropriate.
Steve Prince	Ch.5		1275		1279	Ch. 4 material?	The objective of the setion is to describes food production system. Drivers are more appropriately addressed in Chapters 3 and 4
Dan Pennock	Ch.5	32	1283	32	1287	Are Australia, Canada etc. really cash-poor economies?	Addressed. We removed the incorrect sentence.
India NFP	Ch.5	32	1283	32	1287	Th text in line no. 1283-1287 that reads- " <i>In cash-poor economies such as Australia, Canada, the United States of America, Japan, New Zealand, India (the Bhil) and the Federated States of Micronesia, which depend on volatile global market of fluctuating food prices, the maintenance of local knowledge and cultural traditions regarding food is a matter not only of cultural identity and transmission, but also of maintaining food security and 1287 nutritional health (Nancy J. Turner, Plotkin, et al., 2013).</i> " The reference to the countries cited in this sentence as cash poor economy in the stated context needs to be clarified.	Addressed. We removed the incorrect sentence.
Carolina Ziehl	Ch.5	33	1308	33	1340	There are examples of traditional food/ingredients loss due to land degradation. Traditional crop systems in Mexico, like chinampas, metaplantes, milpas, etc, can produce a wide variety of traditional creole food. Technification and modernization of traditional crop systems reduces the variety of farmed products and the biodiversity associated, also causes traditional knowledge loss.	Thank you for the comment. We have tried to cover this issue with several case studies from around the world.
Germany	Ch.5	33	1330	33	1340	It seems to be an important finding that infrastructure such as dams can also cause ecosystem degradation. Would this need to be reflected in one of the key messages of the summary for policymakers?	Highlighted in the energy section, and in the executive summary of CH 5.
UNCCD SPI	Ch.5	34	1345	34	1345	Spelling of conservation	Thank you we have corrected this error
Javier Ernesto Cortés Suárez	Ch.5	34	1346	34	1346	These acronym should be clarified. I suggest a list of acronyms and definitions at the beginning of the chapter.	There is a glossary for the entire document. In addition, we define terms twice, at first mention in the executive summary, and at first mention in the main body text. The term in question has been previously defined.
Steve Prince	Ch.5		1347		1363	Ch. 4?	Addressed. Substantial parts of the text, as well as the map "A world of opportunity", were deleted or transferred to CH 3 and 4.
Virginia Meléndez Ramírez	Ch.5	34	1353	34	1354	Check writing.	Addressed. Substantial parts of the text, as well as the map "A world of opportunity", were deleted or transferred to CH 3 and 4.
K.N.Ninan	Ch.5	35	1365			What is 'remote restoration' ? Is this term defined in the report. All such terms used in the chapter or assessment report should be defined and included in a glossary of terms used in the assessment report for the benefit of readers.	Addressed. Substantial parts of the text were deleted or transferred to CH 3 and 4.
Germany	Ch.5	35	1365			This Figure has a low resolution quality. Please improve.	Addressed. Substantial parts of the text were deleted or transferred to CH 3 and 4.
Steve Prince	Ch.5		1378		1381	Ch.4?	Addressed. Substantial parts of the text were edited, deleted or transferred to CH 3 and 4.
Shengsong LI	Ch.5	35	1380	35	1381	This is conditionally true depending on the purpose of tree planting. In many places, trees are planted as windbreak to protect against wind erosion, and their roles as soil fertility enhancement, soil moisture improvement, and yield increase are limited.	Thank you. We removed substantial parts but this relates directly to topic of food security!!

Peter Elias	Ch.5	35	1386	1387	1387	This is also corroborated in the work of Fasona, M. Oloukoi, G. Olorunfemi, F. , Elias, P. & Adedayo, V. (2014) on 'Aspects of Natural Resource Use and Adaptation to Climate Change in the Nigeria Savanna' in: Frontiers in Environmental Research and Sustainable Environment in the 21st Century. Ibadan University Press, pp 323-342	Reference added.
Germany	Ch.5	36	1388	36	1396	Please cross-check with the definition provided for "agroforestry" in chapter 3, page 32, lines 946-950. It is unusual to have two different wordings to define the same thing in one report. Maybe you could align the wording or just refer to chapter 3?	Definition was removed, since it does not belong here. Reference was made to Chapter 3 and 6 for this topic.
Steve Prince	Ch.5		1391		1391	Cite Ch. 4 Sect. 4.3.4.6.	Addressed. We deleted the definition of agroforestry from here, and referred to the appropriate section to find it in CH4, by adding a footnote.
Steve Prince	Ch.5		1425		1429	Ch.4? See overall comment on line 1.	Addressed. Substantial parts of the text were deleted or transferred to CH 3 and 4 as appropriate.
Shenggong LI	Ch.5	37	1442	39	1518	This box is too wordy and should be shorten or combine with the context	Addressed. The box was deleted, since most of its content was already in other chapters, and substantial parts of its content were transferred to CH 6.
Sandhya Chandrasekharan	Ch.5	38	1478	38	1483	A dissemination strategy and political support for agroecology is of policy relevance. Can the information be more subbtaintial about the Brazilian strategy, quantified, methods detailed etc? Dealing with institutionalised power/ inertia/ vested interests that prevent agroecology requires much more deliberation on strategy. So these elements / that story needs to be discussed/told as well.	Addressed. The comment is very relevant, but does not belong here. This was discussed with Chapter 6 authors, and it is presented on section 6.4.
Otávio Gadiani Ferrarini and Carlos Alberto de Mattos Scaramuzza	Ch.5	38	1478	38	1482	Add in this description the National Policy on Agroecology and Organic Production (Pnapo), Decree No. 7.794, of August 20, 2012. This is the main Brazilian policy for strengthening agroecology.	We transferred substantial portions of this section on Agroforestry, including the Brazilian example, to Chapter 6, to avoid repetition, and be consistent with the objectives and scoped of each chapter. Chapter 6 focuses on Responses to halt land degradation and to restore degraded land, and has a specific section on governance and policies (6.4.2).
Cantele, Matthew	Ch.5	39	1519			I think a more balanced overview of sustainable intensification and whether it is truly sustainable as well as the potential indirect land use implications should be covered here. SI can in some cases lead to further agricultural expansion and may not be viable due to existing biophysical barriers (e.g., soil quality).	This is a fair point. The intention of this chapter is to focus on human impacts rather than to evaluate biophysical sustainability (we perhaps went too far to the latter than we should have in this section). Rather than building the section further in that direction, we have added text pointing to potential mixed impacts of sustainable intensification, and have inserted cross-reference to sections 7.2.1.2 and 7.3.1 for more detail.
Australia NFP	Ch.5	39	1531	39	1541	The link between organic farming and increased water holding capacity of the soil, and thus, increased water use efficiency is tenuous. The concept of organic farming and sustainable farming are often interchanged wrongly. The definition of organic farming in this context needs to be clear.	This sentence has been clarified. Organic farming is no longer discussed in the speicic context of increasing water use efficiency.
Dan Pennock	Ch.5	39	1539	39	1541	More recent meta-analyses (eg Seufert, Ramankutty, and Foley 2012 Nature 485) have shown that yields are significantly lower in organic systems compared to conventional (discussed on the next page).	This is an important point. We have added a discussion of Seufert et al's results
Sandhya Chandrasekharan	Ch.5	40	1580	41	1609	This, to my mind, is an important section, and an important alternative/ way-forward strategy to support. A lot more substantial treatment in terms of the specifics of the areas being examined, the people involved, the food supply being met, market flows, management systems etc, would be useful to inform / shape the rights kinds of policy	We thank the reviewer for the comment, but this goes beyond the scope of this section, which is to present a general overview of the interlinkages between land degradation and food security. Chapter 6 if forward looking, and presents more detailed information on policy options and avenues to support small-holder farming practices.
U.S. government	Ch.5	40	1580			I find the use of boxes to be very effective in this document.	We thank the reviewer for his comment. Boxes were kept.

Agnès Hallosserie	Ch.5	41	1611	43	1678	An important gap in Section 5.4 on health impacts of land degradation is the impact of polluted soils where human settles after the closing of industries. Industrialization is mentioned in the SPM and it would be good to dedicate a point on that matter in the assessment, or at least in the introduction of Section 5.4. See for example the report of two World Health Organization workshops for Europe "Contaminated sites and health" and Science Communication Unit, University of the West of England, Bristol (2013). Science for Environment Policy In-depth Report: Soil Contamination: Impacts on Human Health. Report produced for the European Commission DG Environment, September 2013. Available at: http://ec.europa.eu/environment/integration/research/newsalert/index_en.htm	Thank you - we have added this point to section 5.4.1
Steve Prince	Ch.5		1643		1648	Should this not be much earlier in the Chapter, where concepts are presented?	Thank you for the suggestion. That particular figure has a health focus, so we have left it in the health section, but we have added a cross-reference to it in our introductory section.
Steve Prince	Ch.5		1650		1667	Chs 3 & 4? See overall comment on line 1.	While we agree that this is covered in Chapter 4, each Chapter to some extent should standalone - therefore we believe this text provides important information on climate change impacts.
Carolina Ziehl	Ch.5	42	1665	42	1667	In this line it is stated that "Higher biodiversity ecosystems can also have a greater overall richness of new pathogens that can eventually enter human populations; and biodiversity loss may therefore decrease the total richness of pathogens that humans encounter". Such affirmation although true, lacks understanding and scope about the complex phenomenon of emergent infectious diseases. First of all, such an affirmation should be quoted. Secondly, making such affirmation without context and due to the nature of this assessment may give the wrong message to policy makers; it's like saying that "high biodiversity is a problem for human health because it houses pathogens". Such misconceptions can easily lead to uninformed decisions and malpractice. Such consequences have happened in the past; a lot of wetlands, lakes, ponds and river streams were dredged in the past to avoid vector borne diseases (by mosquitos in particular) with huge environmental impacts and consequences that also damaged human well being. It has been observed that ecosystems with high biodiversity that can also have a great overall richness of new pathogens, but it also prevents them to enter human populations. This happens because high biodiversity translates in a wide variety of hosts, reservoirs and competitors, or even natural enemies for pathogens; a lot of pathogens are host-specific and will rely on certain species to complete their life cycles. For those pathogens able to change hosts, a greater amount of options will reduce the risk of human exposure. The loss of available natural hosts may reduce host-specific pathogens, but will fail to eliminate zoonotic diseases (because these pathogens have the virulence and mutagenic capacity to actually infect humans in the absence of their regular natural hosts). Actually many studies have seen that zoonotic diseases are associated to environmental changes or degradation (Daszak et al., 2000). Hence, I recommend quoting this and adding that "although biodiversity loss may decrease the total richness of pathogens, this does not guarantee the elimination of aggressive zoonotic diseases and could actually trigger the emergence of infectious diseases in humans". Daszak, P., Cunningham, A. A., & Hyatt, A. D. (2000). Emerging infectious diseases of wildlife--threats to biodiversity and human health. <i>science</i> , 287(5452), 443.	Thank you for the comment. We agree the relationships is complex. We have revised the text to make that clear and have added the reference you suggest.
K.N.Ninan	Ch.5	43	1669			Please improve the resolution of the figure. Otherwise not clear at all.	This is due to the conversion of word document to PDF. It will be high resolution in the final version. Apologies for the formatting issue.
Steve Prince	Ch.5		1679		1679	From here on I have stopped noting material which might be better in Ch. 4 (and Ch.3). There is quite a lot and it will take some work to disentangle. See overall comment on line 1.	Thanks - please see our response above on the comment on line 1167 and overall comment on line 1
Peter Elias	Ch.5	44	1732	1732	1732	repeated words: 'has been not been'	We have checked the references and changed it to "has not been"

Carolina Ziehl	Ch.5	45	1755	45	1757	et al., 2001; Ostfeld, 2009; Bradley & Altizer, 2007) and a lot of them are related to vector-borne diseases. Even so, there are similarities between the factors that lead to de emergence of infectious diseases in humans and wildlife (Daszak et al., 2001). The mechanism of biodiversity dilution is one of many explanations to the role of biodiversity and zoonotic diseases; nonetheless, caution is to be taken while jumping to any conclusion as biodiversity-disease relationship is a multifactorial process (Zargar et al., 2015). The fact that vector-borne diseases exemplify more clearly the effect of biodiversity dilution, does not mean that this phenomenon is not true to directly transmitted zoonoses...Furthermore, vector-borne diseases are becoming a threat to human health (Heyman et al., 2010; Ostfeld & Keesing, 2000), and as such, the protective role of biodiversity richness should not be ignored or overlooked because as stated in line 1758 "biodiversity ecosystems have a higher overall diversity of pathogens in their zoonotic pool". (Ostfeld, 2009) shows that a high diversity in vertebrate community reduces the risk of human exposure (in this case with ticks as vectors). They observed that where native vertebrate diversity is high, vectors feed from a wider variety of hosts, most of which are poor reservoirs for the pathogens, reducing infection prevalence. This last statement stays true to other pathogens; species richness provide a wide arrange of hosts, some of them poor reservoirs which will reduce the risk of infection. In this sense, patterns of infectious disease emergece are complex and involve multifactorial processes; but land degradation, loss of biodiversity, wildlife population decline, and other effects of environmental change due to human activities, can trigger in a lot of cases the emergence of diseases and pose a threat to human well being. It would also be interesting to include the example of tick-borne diseases of Europe and North America (Heyman et al., 2010; Ostfeld & Keesing, 2000). Daszak, P., Cunningham, A. A., & Hyatt, A. D. (2001). Anthropogenic environmental change and the emergence of infectious diseases in wildlife. Acta tropica, 78(2), 103-116. Ostfeld, R. S. (2009). Biodiversity loss and the rise of zoonotic pathogens. Clinical Microbiology and Infection, 15, 40-43. Heyman, P., Cochez, C., Hofhuis, A., Van Der Giessen, J., Sprong, H., Porter, S. R., ... & Papa, A. (2010). A clear and present danger: tick-borne diseases in Europe. Expert review of anti-infective therapy, 8(1), 33-50. Perkins, S. E., Cattadori, I. M., Tagliapietra, V., Rizzoli, A. P., & Hudson, P. J. (2006). Localized deer absence leads to tick amplification. Ecology, 87(8), 1981-1986. Ostfeld, R. S., & Keesing, F.	We completely agree with this point. We actually discuss this issue in detail in Section 5.4.1 when we discuss zoophylaxis - which is poorly understood but certainly plays a role in tick borne disease such as Lyme's Disease
McAfee, Brenda	Ch.5	45	1769	45	1769	should be native host populations	The wording is correct - we mean unexposed or naive host populations
K.N.Ninan	Ch.5	46	1811	46	1821	"...land conversion (often deforestation).....introduces pathogens into human populations. Also free grazing of livestock in forests has spread livestock diseases such as foot and mouth/rinderpest disease to wild life. Wild buffalo (Gaur) population in Bandhipur national park in the Western Ghats biodiversity hotspot in India decades ago (i.e. 1968) was almost wiped out due to riderpest infection spread through livestock grazing in forest lands.Degradation or encroachment of CPRs and village grazing lands has contributed to this trend.	Thanks - this is a great point - but the focus of this section is how land degradation affects human health so the example, while interesting and generally relevant, does not support the specific causal pathway degradation - pathogens - human health. Chapter 4 of this assessment deals with changes in ecosystem function and biodiversity.
McAfee, Brenda	Ch.5	47	1864	47	1864	worst-off and best-off countries, is this referring to levels of degradation, the extent of negative impacts on health or the economies?	It refers to the health measure. Sentence has been rephrased to clairify.
Steve Prince	Ch.5		1868		1873	This has general application to a lot of the topics in the chapter. Maybe it would be better earlier, where concepts are presented.	DALY is primarily a health measure so we think it is appropriate to present it here.
K.N.Ninan	Ch.5	48	1874	48	1888	May also like to discuss how wetland/lakes degradation/destruction through encroachments and dumping of municipal wastes/sewage especially in cities is having adverse effects on ecosystem services (habitat for fish and migratory birds; water supply,recreation services, managing storm surges, etc.) and also contributing to health hazards such as water borne diseases in many Indian cities such as Bangalore, Hyderabad (possibly in most developing countries).	These are all excellent points. There was a discussion among the authors where to include the health impacts of changes in water quality to avoid duplication, and we decided to include these points in Section 5.8.2
U.S. government	Ch.5	48	1875	48	1876	Consider inserting "functions or" between 'ecosystem' and 'services' to make it more understandable to those bound by policy analysis or natural capital accounting protocols.	We have added function here. Thanks.

Royal Gardner and Ruth Cromie	Ch.5	49	1895	49	1897	Regarding the sentence on restored wetlands possibly reintroducing mosquito populations, please consider the following suggested edit and additional reference: However, restored wetlands may reintroduce mosquito populations that vector once-eradicated diseases. Whilst recognising that there are a range of options for managing mosquitos (e.g. Dale and Knight 2008), their re-establishment can pose a potential trade-off for decision makers working to optimize public health benefits of ecosystem restoration (Willott, 2004). Dale, P.E.R. & Knight, J.M. Wetlands Ecol Manage (2008) 16: 255. doi:10.1007/s11273-008-9098-2	Thank you - we have modified the sentence as suggested - only replacing rehabilitated with restored to be consistent with IPBES terminology.
Germany	Ch.5	49	1898	50	1973	There is quite some repetition between the sections 5.4.5 and 5.4.6. For instance, information on page 50, lines 1952-1954 is already available on page 49, lines 1921-1923. Information provided on page 50, lines 1957-1958 can be found on page 49, lines 1924-1926. Please revise these sections.	We have rewritten this section and removed the duplication.
Javier Ernesto Cortés Suárez	Ch.5	49	1898	49	1898	These should also consider the clinical value of wildlife (e.g. anurans), since the title is talking about biodiversity as a whole.	We agree - we have added an example of ACE inhibitors that were developed from snake venom to treat blood pressure.
Peter Elias	Ch.5	49	1911	1911	1911	Simpson et al (1996)	Thank you. We have revised the text.
Peter Elias	Ch.5	49	1924	1926	1926	Repeated again on page 50 line 1957-1959	We have rewritten this section and removed the duplication.
Finnish Government	Ch.5	49	1931	52	2045	Is this chapter (5.4.6) really essential in Land degradation report ? Focus the report more precisely on land degradation issues.	We have rewritten it and clearly tied it to land degradation. Urbanisation and loss of natural areas is a form of degradation.
Virginia Meléndez Ramírez	Ch.5	49	1931	49	1931	you can check: http://ac.els-cdn.com/S2212041614001648/1-s2.0-S2212041614001648-main.pdf?_tid=d839fd58-5851-11e7-8bfc-00000aacb35e&acdnat=1498249600_f63ed99edb2d2d3e38608ae61c86f10c	Thank you - we have included the citation in the revised text.
Peter Elias	Ch.5	50	1957	1959	1959	Repeated earlier on page 49 line 1924-1926	We have rewritten this section and removed the duplication.
Shenggong LI	Ch.5	51	1984	52	2045	This subsection appears to cover the effects of global change rather than "land degradation causing ... "	This section has been removed.
NFP of China	Ch.5	51	2008	51	2010	The causal link is one-sided : the reduction of recreation benefits is caused by not only the reduction of forest land, wetlands and water area, but also other factors,we recommend to delete this case	We agree the reduction in recreation benefits is multi-causal. We have rephrased the sentence to make it clear loss of nature is not the only cause.
Germany	Ch.5	51	2012	51	2012	Please add alien: "In addition to land use change, alien invasive species are negatively affecting land- and water-based..."	All uses of "invasive species" (and variants) in the chapter have been changed to "invasive alien species"
Finnish Government	Ch.5	51	2012	52	2045	The chapter (5.4.6.1) introduces also topics that are beyond the topic of the paper: invasive species 2012-2029 and climate change and outdoor recreation 2030-2045	We agree this section has been removed.
Germany	Ch.5	51	2013	51	2013	Shouldn't it read invasive alien species by definition? Please cross-check with the original source.	All uses of "invasive species" (and variants) in the chapter have been changed to "invasive alien species"
Germany	Ch.5	51	2014		2015	Remark on the following sentence: "Invasive species can be considered as a consequence of land use changes, ...": Please add alien. Furthermore: The spread of alien invasive species is mainly caused by trade and transport, therefore the sentence is somewhat misleading. Also, it is not fully proven, that land use change is the main factor for the establishment and spread of alien species.	All uses of "invasive species" (and variants) in the chapter have been changed to "invasive alien species"
Germany	Ch.5	51	2016	51	2017	Please add alien: "In broad terms, invasive alien species negatively influence tourism..."	All uses of "invasive species" (and variants) in the chapter have been changed to "invasive alien species"
Germany	Ch.5	51	2020	51	2020	Please add alien: "...invasive alien weed species has negatively affected ..."	All uses of "invasive species" (and variants) in the chapter have been changed to "invasive alien species"
Germany	Ch.5	51	2025	51	2025	Please add alien: "...affected by alien invasive tree species..."	All uses of "invasive species" (and variants) in the chapter have been changed to "invasive alien species"

Germany	Ch.5	51	2026	51	2027	The sentence in it's current version is somehow misleading, since invasive species do have negative consequences per definition - at least on biodiversity. And on a global scale invasive alien species are among the five major causes for biodiversity loss. In order to avoid misunderstandings the following rephrasing is proposed: delete "not all report of invasive species has been negative," add alien, and add a qualifier at the end, so it then would read: However, there has been also positive impacts on recreation services observed for invasive alien species, in particular for fishing activities, but with the negative consequence of threatening native biodiversity.	On revision we have deleted this section based on comments of other reviewers. This point is now moot.
Mahmood Yekeh Yazdandoost	Ch.5	52	2037	52	2038	Since the main cause of climate change is global warming, the sentence should be written in a more appropriate way. It has been observed in other places too.	On revision we have deleted this section based on comments of other reviewers. This point is now moot
Germany	Ch.5	52	2038	52	2039	Maybe coral bleaching due to higher water temperatures and the effects on diving tourism should be mentioned here, too.	On revision we have deleted this section based on comments of other reviewers. This point is now moot
Samuel Evans	Ch.5	52	2047	54	2131	I found the section on hazards to be generally well-structured, however, I find it could do a more thorough treatment of some of the literature on environmental change, hazards, and adaptation. Neil Adger is one author in particular who has published much useful work on these topics. I have suggested five references below that could be useful to include (may also be useful to include other references used by these five).	Thank you for this comment, the references were extended.
Samuel Evans	Ch.5	52	2047	54	2131	Suggested reference 1: UNISDR. (2015). <i>Global Assessment Report on Disaster Risk Reduction. United Nations International Strategy for Disaster Reduction (UNISDR)</i> . https://doi.org/9789211320282	Thank you. Reference was added.
Samuel Evans	Ch.5	52	2047	54	2131	Suggested reference 2: Adger, W. N. (2005). Social-Ecological Resilience to Coastal Disasters. <i>Science</i> , 309 (5737), 1036–1039. https://doi.org/10.1126/science.1112122	Thank you. Reference was added.
Samuel Evans	Ch.5	52	2047	54	2131	Suggested reference 3: Sidle, R. C., Taylor, D., Lu, X. X., Adger, W. N., Lowe, D. J., de Lange, W. P., Newnham, R. M., & Dodson, J. R. (2004). Interactions of natural hazards and society in Austral-Asia: Evidence in past and recent records. <i>Quaternary International</i> , 118 –119, 181–203. https://doi.org/10.1016/S1040-6182(03)00137-X	Thank you. Reference was added.
Samuel Evans	Ch.5	52	2047	54	2131	Suggested reference 4: O'Keefe, P., Westgate, K., & Wisner, B. (1976). Taking the naturalness out of natural disasters. <i>Nature</i> , 260 (5552), 566–567. https://doi.org/10.1038/260566a0	Thank you. Reference was added.
Samuel Evans	Ch.5	52	2047	54	2131	Suggested reference 5: Adger, W. N., & Brooks, N. (2003). Does global environmental change cause vulnerability to disaster? <i>Natural Disasters and Development in a Globalizing World</i> , 250. https://doi.org/10.4324/9780203402375	Thank you. Reference was added.
Shenggong LI	Ch.5	52	2061	52	2061	remove "regulation"	removed
Shenggong LI	Ch.5	52	2067	52	2069	Here "corruption" is cited as causes for deforestation and subsequently flooding ? This depends. Otherwise the effect of corruption is are included in other activities.	This part of the text was further explained. Apart from deforestation, links to socioeconomic aspects (e.g. population density, and urban population growth, flood management, corruption) can explain the relationship between large flood events at country level.
Germany	Ch.5	53	2085			This Box has a low resolution quality. Please improve resolution of the satellite image.	Thank you - we have replaced this version with the full-resolution version from the original source. There is still some pixelation (it is a satellite image), but it is better than before and is the best resolution available.
Shenggong LI	Ch.5	54	2099	5	2131	Input a box to introduce "mangrove forest".	Thank you, mangrove was introduced in the text.
Virginia Meléndez Ramírez	Ch.5	54	2131	54	2131	some experiences in Mexico: https://www.academia.edu/27877074/2016-libro_Experiencias_mexicanas.pdf Chapter 20	Thank you, but unfortunately this publication is available only in Spanish.
K.N.Ninan	Ch.5	54	2132			Human Security'. Please include a Glossary of terms used in the assessment report such as these for the benefit of readers/policy makers/ scientists and scholars	There is a glossary that will be a part of the full assessment

Germany	Ch.5	55	2142	55	2155	The issue on conflicts was also discussed in previous chapters. Please consider cross-referencing between chapter.	Thank you. A cross-reference has been added to 2.2.2.3
Elizabeth Hess	Ch.5	55	2142	59	2280	When reading the conflict section, one item that jumped out of me that might be of interest to highlight is excessive hog farms (Concentrated Animal Feeding Operations). There are several examples of conflict over excessive hog manure due to pollution of natural resources and impact on communities	Thank you for this suggestion. We researched the hog farm example, but were not able to find peer-reviewed literature of examples where the conflict was mediated through land degradation specifically.
Sofía Valeria Cortés Calderón	Ch.5	55	2148	55	2155	Not only environmental degradation may increase directly and indirectly the risk of violent conflict, but also the way to access and manage land resources lead to conflict. There are number of well-documented cases in Latin America where drug trafficking network, others organized crime groups, transnational corporations and local/regional authorities are colluded to deprive brutally indigenous and vulnerable groups of their own lands and natural resources. I urge to search, analyze and incorporate this current and critical link into the conflict section as well as the executive summary.	These are important issues, but beyond the scope of this particular section that focuses on ways that land degradation itself affects rates of conflict.
McAfee, Brenda	Ch.5	58	2229	58	2229	In Kenya, many of the same resource constraints exist as in Somalia	Thank you
Steve Prince	Ch.5		2229		2229	Kenya repeated	Thank you
K.N.Ninan	Ch.5	58	2236	59	2280	No discussion about assertion of state's rights over forest resources and village forests/community lands (which were well and communally managed) leading to conflicts between the state and local communities over access to and use of forest resources. These also resulted in arson (setting fire to forests; illegal poaching), etc.	The section was meant to focus on cases where land degradation itself has an effect on violent conflict. Conflict over access to land and resources in general is beyond the scope
Peter Elias	Ch.5	58	2238	2238	2238	insert 'of' after levels	Thank you
Shihai LV	Ch.5	58	2261	58	2261	"," following (Box 5.9) should be changed with ","	Thank you
India NFP	Ch.5	59	2268	59	2271	The text in lines 2268-2271 reads: " <i>Several of the world's more contentious geo-political relationships also sit in areas of water stress and/or areas where essential waterways are shared by two or more countries. For example, the India-Pakistan dispute in Kashmir is complicated by the fact that both countries share the water of the Indus River.</i> " This example is factually incorrect and may be deleted.	We have rephrased this example
K.N.Ninan	Ch.5	60	2329	61		You may like to discuss about 'Environmental/Climate Refugees' due to climatic factors. Migration can also be of temporary or permanent nature. During drought periods farmers/rural households migrate to cities in search of job opportunities, etc which is a familiar phenomenon in drought prone regions in India. See the following article by Architesh Panda: Climate Refugees- Implications for India, Economic and Political Weekly, Volume 45 (No. 20), May 15-21, 2010	Thank you for the example. We have added the Panda reference
Samuel Evans	Ch.5	61	2342	62	2390	This section is a well done and is a useful framing of the relationship between energy and human quality of life. However, it isn't always clear where the link to land degradation and restoration is. Can that be explained more explicitly?	Thank you for the comment. We have amended the second paragraph of 5.7.1 to show that the links between energy and degradation are treated in more depth in 5.7.2, with 5.7.1. designed to link energy and well-being.
Samuel Evans	Ch.5	61	2342	62	2390	5.7.1: - Might consider referencing Gertler et al. 2016, which shows that energy demand is highly non-linear as incomes grow. More income = increasingly higher demand for energy-using products (e.g. appliances). (Gertler, 2016, The Demand for Energy Using Assets Among the World's Rising Middle Classes. American Economic Review)	Thanks for the suggestion - we have included this reference.
Samuel Evans	Ch.5	61	2342	64	2474	Could benefit from one more proofread for grammar.	The entire manuscript has benefitted from a hard proof-read.
Samuel Evans	Ch.5	61	2342	64	2474	Pick wellbeing or well-being. Both are used.	Consistent with the SPM, all instances have been changed to well-being
Wayne Twine	Ch.5	62	2381	63		For impact of degradation on fuel quality, with measurable health cost, see: Jagger, P. & Shively, G. (2014) Land Use Change, Fuel Use and Respiratory Health in Uganda. Energy policy, 67, 713–726.	Thanks, we have included this reference, and a sentence on thier main findings.

Samuel Evans	Ch.5	62	2393	63	2439	5.7.2.1: A few additional studies on the relationship between land degradation and energy: Gebreegziabher Z, van Kooten GC, van Soest D (2005) Land Degradation in Ethiopia: What do stoves have to do with it? Working Paper Heltberg R, Arndt C, Sekhar NU (2000) Fuelwood Consumption and Forest Degradation: A Household Model for Domestic Energy Substitution in Rural India. Land Economics. 76(2)	Thank you - we have included the Heltberg paper, as an example of constraints on fuel switching. We could not include the working paper as this would be contrary to IPBES policy on the use of literature.
Shihai LV	Ch.5	62	2393	62	2393	I think it's better to use "Traditional biomass energy sources" as the subhead of 5.7.2.1 then "Traditional biomass"	Thank you for the suggestion, we have made this change.
Samuel Evans	Ch.5	63	2393	63	2439	In 5.7.2.1, many of the sentences are missing periods.	We have done a thorough proof-read to correct editorial errors.
Wayne Twine	Ch.5		2410		2416	Would be useful to unpack key ecosystem/biodiversity impacts (degradation) of fuelwood harvesting, which is much more widespread than full deforestation from wood harvesting e.g. on habitat structure such as: Du Plessis, M. (1995) The effects of fuelwood removal on the diversity of some cavity-using birds and mammals in South Africa. Biological Conservation, 74, 77–82.	Included this reference as an example of a biodiversity-specific impact, and also re-worked text to differentiate between deforestation, and the degradation that results from selective harvesting.
Samuel Evans	Ch.5	62	2413	62	2414	The sentence with the Geist and Lambin reference is odd. Doesn't seem to fit, or at least needs to explain what the study is about.	Sentence have been amended to be more clear
Virginia Meléndez Ramírez	Ch.5	62	2419	62	2419	For example extraction for firewood.	Thanks for the comment. We do not want to list fuelwood sources here, it is meant as a general observation that pertains to all sources of biomass - charcoal too.
Virginia Meléndez Ramírez	Ch.5	63	2447	63	2447	These are monocultures with technified agricultural practices that degrade the area of cultivation.	Thanks for the comment, but we are of the opinion that the reference to commodity prices is adequate to show that we are referring to large scale agriculture and biofuels.
Martin Obermaier	Ch.5	63	2447	63	2454	This paragraph is a bit confusing and should be rewritten. The last half sentence 'the teleconnected nature of iLUC, mediated by trade and prices of two different commodities, presents an important, but challenging consideration' probably needs an example and reference for better understanding.	Paragraph has been rewritten as requested.
Samuel Evans	Ch.5	63	2455	63	2457	5.7.2.2: Several authors from the Searchinger 2008 Science paper conducted a more nuanced analysis that suggested the initial results were over-stated: Dumortier, Jerome, Dermot J Hayes, Miguel Carriquiry, Fengxia Dong, Xiaodong Du, Amani Elobeid, Jacinto F Fabiosa, and Simla Tokgoz. 2011. "Sensitivity of Carbon Emission Estimates from Indirect Land-Use Change." Applied Economic Perspectives and Policy 33 (3): 428–48.	Thank you, we have included the newer paper, and added text to show this overestimate.
Martin Obermaier	Ch.5	63	2461	63	2463	I would emphasize the importance of (i) specific policy contexts and (ii) macroeconomic interconnections; these are relevant also for the land degradation-ILUC context. For Brazil the recent CLIMA (clima.org.br) project finds that competing claims over land for food, biofuels and conservation (including recovering degraded lands) are intensified by lack of policy enforcement. Under (i) a scenario of increasing food (cattle, foodcrops) and biofuels production and reduced deforestation, but failure to recuperate degraded lands (Brazil's aims to recover 15 million of degraded pasture by 2030, but progress in this respect has been minimal up to now) our scenario analysis shows that food prices may increase up to 16% by 2030, with poorer households significantly reducing their expenditures on other goods/services (energy, other) in order to guarantee their food security. In other words, the failure to invest in recovering degraded lands while simultaneously promoting biofuels expansion may increase food prices. However, (ii) food prices increases are in part recovered by a stronger growth of the Brazilian economy, which also benefits poorer populations. Macroeconomic feedbacks are thus important to be studied if one is interested in understanding ILUC impacts due to biofuels expansion. (Obermaier, M., Wills, W., King, C., Scanlon, B., Xavier, A., Rodrigues, R., Moreira, M., Kimura, W., et al. Integrated Modeling of the Land Use, Water and Energy Nexus of Brazilian Biofuels Expansion under Climate Change. Work in Progress.	Thanks, these are really relevant findings, but we cannot include results from work in progress. I have highlighted in the text that policy enforcement remains as a source of variation, but I had to do so in a generic manner.
Samuel Evans	Ch.5	63	2468	63	2471	Our study (Evans et al 2015) was in response to a <i>Science</i> study on the same issue. You should probably include their findings as well: Righelato, Renton, and Dominick V Spracklen. 2007. "Carbon Mitigation by Biofuels or by Saving and Restoring Forests?" <i>Science</i> 317 (5840): 902.	Thank you, we have included these references and some of the relevant findings.

K.N.Ninan	Ch.5	64	2475	67		This section and following sub sections on 'Water Security' 'Water footprint', etc: Need to strengthen these sections and esp.link them up with land degradation. Not obvious to the reader and these sections seem to be stand alone sections. Focus on water security etc. should from the viewpoint of and link with land degradation issues.	This is a good point, and the section has been revised and additional references have been included to make these links more clear.
Australia NFP	Ch.5	65	2500	65	2518	Please insert the following text after the end of the sentence on line 2518: <i>This calls for prudent water management policies with a focus on effectively valuing water and boosting efficiency to achieve the outcomes of universal access to safe drinking water, adequate sanitation and hygiene, improved water quality, enhanced adaption to climate change and improved ecosystem protection.</i>	Done
Germany	Ch.5	65	2500	67	2569	Improve the quality of the following Figures: 5.12 / 5.13 / 5.15.	The figures have been improved in the final draft
Shenggong LI	Ch.5	65	2507	65	3507	"changing land use"-->"land use change"	This section has been edited.
NFP of China	Ch.5	65	2526	65	2527	The data does not match the actual situation,we recommend to modify or delete	Thank you for the comments, this sentence has been corrected.
McAfee, Brenda	Ch.5	67	2556			but does not identify flows between Canada and USA. The figure reproduced in 5.14 comes from the publication Mekonnen, M.M. and Hoekstra, A.Y. (2011) National water footprint accounts: the green, blue and grey water footprint of production and consumption, Value of Water Research Report Series No. 50, UNESCO-IHE,	Thanks for catching this. The reference has been updated to the publication that resulted from this work by Hoekstra and Mekonnen, 2012. The water footprint of humanity. PNAS 3232-3237.
Germany	Ch.5	67	2569	67	2569	1,000-2,000 liters for producing how much grain?	This has been clarified.
U.S. government	Ch.5	68	2570	69	2646	Much of the text in 5.8.2.1 (lines 2575-2583), as well as text in lines 2619-2626 is already provided elsewhere in the document. Also, this section alternates between being organized by land degradation type, and by freshwater ecosystem service. Consider having this section reference the stressor descriptions in other sections, and focus on the effects on the services, and organize by service (drinking water, fisheries/food production, recreation). A diagram would also be helpful.	These sections have been edited to reduce some redundancy, retaining what is necessary for the logic of this section.
U.S. government	Ch.5	68	2591	68	2608	Degradation can also lead to warmer water (lack of shading of streams and other water bodies) - which is an aspect of water quality and can lead to human health impacts (or require mitigation - e.g., cooling of water supplies before entering a municipal supply).	Done
McAfee, Brenda	Ch.5	68	2614	68	2614	The sentence needs clarification. E.g. Mining leads to a complex set of activities that degrade land involving deforestation, mining? Perhaps second mining is a typo?	Done
Germany	Ch.5	69	2636	69	2638	Environmental issues emerging from pharmaceuticals and personal care produces in water supplies are key findings, but are currently not reflected in the key messages of the SPM. Please cross-check.	We passed this on to the SPM team. In the end - while not specifically stated - the issue of consumption driven issue causing water pollution is emphasized.
Shihai LV	Ch.5	69	2647	69	2647	May be the subhead of 5.8.3 should be changed with "Impacts of restoration of degraded land on water security"	A good suggestion, this has been done
Emmanuelle Quillérou	Ch.5	70	2661	70	2662	You could add a reference to Sengalama, T., Quillérou, E. (2016) Paying for water in Uganda: is paying upstream land users a possible solution? The Solutions Journal, Special issue on "Sustainable Land Solutions", September-October, 64-73.	Thanks for pointing out this reference, it has been added to the text.
Shihai LV	Ch.5	70	2694	70	2694	A paragraph of atmospheric environmental quality security should be added, because of land degradation may lead to an increase in PM ₁₀ , CO ₂ , NH ₄ , and N ₂ O, which alters the security of the atmosphere.	While we agree that land degradation does cause atmospheric pollution, we believe that these issues have been well addressed in IPCC assessments. In addition, we do touch on the issue related to air pollution through land degradation in section 5.4
Peter Elias	Ch.5	70	2703	2703	2703	been shown instead of been show	Thank you. Correction made.
Peter Elias	Ch.5	71	2710	2711	2711	Not clear enough	We have rephrased the sentence to read: "acknowledging and evaluating ways ecosystem services contribute to a good quality of life that may not be numerically measured."
McAfee, Brenda	Ch.5	71	2733	71	2733	Should the reference be Windsor and McVey?	Thank you. We have corrected the reference error.

K.N.Ninan	Ch.5	71	2743			"recreation experience with nature exists in western cultures". Well this experience exists in eastern/ asian cultures too. There are temples/pilgrimage centres which are located in forests and attract devotees. For example the Sabarimalai Temple devoted to Lord Ayyappa (a Hindu God) is located in the Periyar Tiger Reserve in Kerala, India and attracts hundreds of thousands of devotees every year from all over the country who derive spiritual solace of pilgrimage to such abodes of worship. There are similar examples from the Himalayas and other forest regions in India and elsewhere. Even in Japan many Buddhist and Shinto temples are located in forests, nature reserves and attract thousands who derive spiritual solace from them. Japanese, for instance are known for their love of forests, nature walks, mountain climbing, etc. So this is not just a feature of western cultures alone but also of eastern and Asian cultures and probably of other cultures as well.	Thank you. We agree whole heartedly with your comment. However, evidence for non-western cultures is sparse. We have added the sentence: "This relationship is likely to exist for many cultures but has yet to be well-documented." In addition, many of the examples you give refer to visits to sacred sites or relationship between nature and a specific religious belief system - these are dealt with extensively in 5.9.2.
India NFP	Ch.5	71	2743			Spiritual element of recreational experience with nature is much more profound in several eastern/asian cultures too. So this is not just a feature of western cultures alone but also of eastern and Asian cultures and probably of other cultures as well.	We agree -however, we were not able to find any specific literature documenting this. We have added the sentence: "This relationship is likely to exist for many cultures but has yet to be well-documented."
Sandhya Chandrasekharan	Ch.5	72	2763	72	2765	the gap between what people say (religious or otherwise) in surveys and what they do is a major problem. Moreover, hypothetical questions posed to "sheep like citizens" are of no use when the options the questions probe are not part of political agendas or real-world possibilities on a meaningful scale. Organised religion encourages hypocrisy is what the stated finding says, yet, it does create or have the scope to create visibility for the collective enterprise of nurturing nature - interesting thing to have accommodated here - some examples (and scale of impact) would add value perhaps?	Thank you for the comment - in re-reading the box - we realized that the way it was written it had obscured our original intent. The goal of the box was to link religious belief, not to discuss how religion drives land degradation or restoration. Those issues are covered in Chapter 2 & 3 of this assessment.
K.N.Ninan	Ch.5	73	2791			Please correct spelling of 'Oceania' in the figure	Thank you. Correction made.
K.N.Ninan	Ch.5	73	2795			Another recent global survey of forest valuation studies noted the recreation values of forests to range between 2010 PPP US\$ 2-279 per ha across forest sites and countries (see Ninan and Inoue: Valuing forest ecosystem services-what we know and what we don't, Ecological Economics, Vol. 93, 2013, pp.137-149.	Thank you. We have added the citation.
Sandhya Chandrasekharan	Ch.5	73	2799	73	2800	important point!	Thank you.
Javier Ernesto Cortés Suárez	Ch.5	74	2810	74	2810	There should be more examples of sacred places from around the world, as well photo documentation.	that are also within protected areas include: Kata Tjuta National Park (Australia), Laguna de la Cocha (Columbia), Sagarmatha National Park (Nepal), Sacred Groves of Oshogbo (Nigeria), Laponian area (Sweden), and Coconino National Forest (USA). Please see Dudley et. 2006 for the detailed descriptions and photo
Virginia Meléndez Ramírez	Ch.5	74	2813	74	2816	you can add some examples.	examples come from first nation's people of Canada. Reduced harvest of the cultural keystone species edible red laver seaweed (Porphyra abbottiae) by Coast Tsimshian, Haida, Heiltsuk, Kwakwaka'wakw people of British Columbia have reduced communal opportunities to learn and teach stories, song, and language
K.N.Ninan	Ch.5	74	2829			There are several other examples of the symbiotic relationship between nature and cultural identity. For instance the Bishnoi community in Rajasthan in India are known for protecting Black bucks and sacred trees. This has been elucidated in the studies by Madhav Gadgil and Ramachandra Guha in India. Nature worship has been part and parcel of Hindu culture and many ancient/eastern/indigenous cultures.	Thank you. We have added the black buck example to the text.
India NFP	Ch.5	74	2829			There are several other examples of the symbiotic relationship between nature and cultural identity, including from India. For instance the Bishnoi community in Rajasthan in India are known for protecting Black bucks and sacred trees. This has been elucidated in the studies by Madhav Gadgil and Ramachandra Guha in India. Nature worship has been part and parcel of Hindu culture and many ancient/eastern/indigenous cultures.	Thank you. We have added the black buck example to the text.
Sofía Valeria Cortés Calderón	Ch.5	74	2846	74	2848	There should be more examples to represent Latin America about the immense value placed on the natural world that cannot be measured in terms of economic benefit or other quantifiable aspects of quality of life.	We have added examples from Yanomami and the concept of "Buen vivir" (or "Vivir bien").

Javier Ernesto Cortés Suárez	Ch.5	75	2849	75	2849	These should also consider that cultural loss it is not necessarily a result of land degradation, but also a product of cultural change dynamic. Similarly, these headland should also incorporate other concepts such as acculturation and transculturation.	Thank you for the insightful comments. We agree that there are many processes cultural loss, however the focus of this assessment is on land degradation so we made the decision to focus this section on the direct linkages between land degradatoin and cultural loss.
Mahmood Yekeh Yazdandoost	Ch.5	75	2874	75	2874	In previous chapters we didn't have conclusion. It is better all chapters follow the same pattern.	Thank you, this is a good point. We have removed the conclusion and incorporated text that had previously been in the conclusion into 5.9.
Shihai LV	Ch.5	75	2875	75	2875	"of quality" should be changed with "on quality"	Thank you. We have made the correction.
Peter Elias	Ch.5	76	2910	2911	2911	Repetition of the word 'by'	Thank you. We have made the correction.
Shenggong LI	Ch.5	76	2910	76	2911	"by by" ->"by"	Thank you. We have made the correction.
Shihai LV	Ch.5	76	2911	76	2911	"by" reated, one of them should be delete	Thank you. We have made the correction.
K.N.Ninan	Ch.5	100	4078			Please check this entry. Pattanayak.... Board of Regents..... Not clear. Please correct this reference. Lot of typos/errors in the chapter which needs to be properly copy edited.	Thank you for catching this. We have flagged the entry to be fixed in the reference database.

Manual for Local Level Assessment of Land Degradation and Sustainable Land Management Part 1 Planning and methodological approach, analysis and reporting. general coordinators Freddy Nachtergaele and Riccardo Biancalani. FAO, Rome, Italy authors.Â Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.Â 1.1 Purpose of the assessment 1.2 Guiding principles 1.3 Target users 1.4 Structure of the LADA Local Manual. 1. 1 3 4 5. It will also examine the implications of land degradation and restoration for reaching key global goals and commitments, including the Sustainable Development Goals (SDGs), the Strategic Plan for Biodiversity 2011â€”2020 and its Aichi Biodiversity Targets and the Paris Agreement on climate change. At a total cost of just under \$1 million, the assessment is the product of three years of work by more than 100 experts, from 45 countries, who together are reviewing more than 3000 scientific papers, Government and other information sources, including indigenous and local knowledge.Â The assessment also evaluates responses to the restoration and rehabilitation of degraded land, options for the avoidance of future degradation and the benefits that this will deliver to people. The Report identifies a mix of governance options, policies and management practices that can help support stakeholders working at all levels to reduce the negative environmental, social and economic consequences of land degradation and to rehabilitate and restore degraded land. The Report encompasses all the terrestrial regions and biomes of the world, recognizing that land degradation drivers and processes can vary in severity within regions and countries as much as between them, and includes the full range of human-altered systems, including but not limited to drylands, agricultural and agr The assessment of land degradation and restoration covers the global status of and trends in land degradation, by region and land cover type; the effect of degradation on biodiversity values, ecosystem services and human well-being; and the state of knowledge, by region and land cover type, of ecosystem restoration extent and options. The assessment aims to enhance the knowledge base for policies for addressing land degradation, desertification and the restoration of degraded land. In January 2015, at IPBES 3, the Plenary approved the launch of the land degradation and restoration assessment t