



DRAFT REPORT PEER REVIEW AND OPEN CONSULTATION ON EMPOWERMENT TOOLS AND NATURE-BASED SOLUTIONS

EMPOWERUS REQUEST

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Background information for reviewers

Welcome to the Eclipse online Review form.

Background: This form was created to review the draft report: "How can community Empowerment Tools (ET) and Nature-Based Solutions (NBS) contribute to addressing coastal challenges and building resilient communities?"; prepared by an Eclipse Expert Working Group (EWG) (<https://eclipse.eu/request-empowerus/>). This knowledge synthesis has been requested by the Project "Socio-economic EMPOWERment of Coastal communities as USers of the sea to ensure sustainable coastal development" (EmpowerUs)

Following the method protocol, the Expert Working Group has now drafted their work: a report that aims to rapidly review and summarise the current state of the existing evidence concerning the role of Nature-based Solutions (NbS) and community Empowerment Tools (ETs) in addressing coastal challenges across Europe, as well as critically assess the impact/outcomes of these interventions in fostering empowerment and therefore resilience within these communities.

The draft report can be found on the Eclipse website and is open for consultation and review until April 22nd, 2024. The Executive summary, the final editing and reformatting of the document will be undertaken after the draft report's review. Eclipse is committed to ensuring the usability of all its products and is therefore organising an open review process of this draft report engaging a range of stakeholders. Thank you very much for your willingness to participate in this extended peer-review. This is an essential and critical phase to ensure the usability of the developed output.

- Deadline to submit your review: April 22nd, 2024 at midnight CEST-

Guidelines:

Before starting the review process, we advise you to first go through the whole survey and to please read the following instructions:

- 1) The text will be language edited by a professional editor once the review is completed, so please do not worry about clumsy wording or typos; only indicate if there are problems of understanding.
- 2) The review form is composed of 5 pages. On this first page, please fill in your name and email address. Please note that in case you want your review to stay anonymous, your name and email will only be communicated to the Eclipse Management Body (EMB).
- 3) On section 2, please find general questions on the report to help improve the usability of the report.
- 4) On section 3, please add specific comments on the report, section by section.
- 5) On section 4, please comment on Annexes.
- 6) On section 5, you can add further comments or general appreciation.



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7) PLEASE add your specific comments for each section of the document, with REFERENCE TO PAGES, SECTION AND FIGURE/TABLE NUMBERS.

8) Please note that by submitting your review, you will still be able to edit your responses and this until the end of the review period (April 22nd, 2024). So if you are not finished with your review but would like to come back to it later, please click on "submit" your review (it is, in a way, a "save" button). You will then receive an email from Google form with an edit link.

Inquiries

If you need help or more information during the review process, please feel free to contact Eclipse at emb@eclipse.eu.

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Answers from the reviewers

Do the discussion address the question of the request and is supported by the results presented in the report?

Reviewer x1: *no comment*

Reviewer x2 : Yes, the discussion addresses the questions to a great extent.

RESPONSE: *Thank you*

Reviewer x3 : yes, it does

RESPONSE: *Thank you*

Reviewer x4 : Yes, the discussion in Section 5 (pages 43-54) addresses the key questions outlined in the request. The discussion covers various aspects of building resilient coastal communities through nature-based solutions (NbS) and empowerment tools. The points made in the discussion are supported by the results and evidence presented throughout the report, particularly in Sections 3 and 4. For example, the discussion on the benefits of NbS (Section 5.1, pages 43-46) is backed by the evidence synthesis in Section 3.1 (pages 15-24) and the case studies in Section 4 (pages 25-42). The discussion on empowerment tools (Section 5.2, pages 46-50) is supported by the evidence synthesis in Section 3.2 (pages 24-29).

RESPONSE: *Thank you for your feedback*

Reviewer x5 : Yes, the discussion comprehensively addressed the request on exploring how empowerment tools and nature-based solutions can contribute in addressing coastal challenges and building resilient communities and is supported by the documented results.

RESPONSE: *Thank you*

Reviewer x6 : Yes, in logical order. I miss some reference to the coastal communities or EmpowerUS TCL - although the report did not in the end address them. Like a recommendation on what they could take from this report or how they could apply the findings. But maybe it's not appropriate since the objectives changed.

RESPONSE: *Thank you very much, we have taken your comment into account and added some information regarding our target audience in the introduction. After an exchange with the requesters, it was decided that we would not provide site-specific recommendations, but would concentrate on conclusions that are relevant to the TCLs and other European coastal areas.*

Reviewer x7 : The discussion builds on the review findings, addressing the questions formulated in the request to some extent. The structure of the discussion can be improved in order to take into account the context where the gathered knowledge will be used. Some inconsistencies, redundancies, and shortcomings can be depicted in the manuscript. I found that relevant results are discussed superficially. For instance, the emerging NBS-related



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challenges (question N. 1) are discussed in general terms without grasping the specificities of coastal areas. I suggest confronting them with those reported in the global and EU NBS roadmaps and elaborating more targeted recommendations for the NBS agenda to coastal resilience, appropriately referenced in the reviewed literature. Moreover, I consider it useful that the discussion section provides more details on the pros and cons of implementing the identified category of empowerment tools in Transition Coastal Labs, or at least coastal areas. Specifically, the section mentioned that the identified empowerment tools should be “utilised effectively...to enhance community resilience and empowerment”. Nonetheless, it does not elaborate on what “utilised effectively” implies in practice. Insights on best practices/lessons learnt could be extracted from the 24 papers that address empowerment tools in NBS contexts and refer to the “empowerment” level. Another limitation can be found highlighting the socio-ecological perspective’s predominance in defining resilience, but without tackling the implications of this perspective for the requester.

An inconsistency can be found in providing an extensive list of empowerment tools extracted from the revised literature while stating the following argument in the discussion Section: “While empowerment may indeed be occurring, there’s limited focus on understanding how”. Building from the results and other discussions, the main gap is in monitoring the extent to which those tools leverage empowerment in real-life contexts instead of how to empower.

Finally, multiple content redundancies can be found mainly across the sections related to research questions N.2 and N.3 (See comment on the methodological framework for further details). The statement about the difference in scope between empowerment and participatory tools is repeated many times throughout different sections of the report, without adding any additional information on the issue.

RESPONSE: Thank you for your feedback! This response is divided in different sections to improve readability.

1. In section 6.2 (as well as the Introduction), the challenges for NbS identified are in line with the ones mentioned in the EU NbS roadmap and recommendations are provided to overcome those challenges. Also, the specificities and challenges of NbS applications in coastal areas, specifically in Europe, is expanded in this section, with examples of applications.
2. In regards to the comment about pros and cons of the application of ETs in the TCLs, we tried that our findings were applicable to all coastal areas in Europe and other high-income countries, so we did not provide examples for these specific areas or analysed whether different tools were more or less effective in a particular area.
3. We have already highlighted the most important lessons from the 24 papers that address NbS+ET and reached the ‘empowerment’ level in section 5.5.3, specifically the methods and indicators used to measure empowerment. Yet, in regard to the empowerment outcomes themselves, no publication provided evidence of temporal changes in regard to this process, and that is discussed in section 6.4.3.
4. We have included more connections of resilience with social-ecological systems in section 6.4.2 and Table 5.
5. The suggestion about the ‘main gap being the extent to which ETs leverage empowerment in real-life contexts instead of how to empower’ was accepted and included at the end of section 6.3 (list of challenges)
6. Redundancies were omitted as much as possible; for instance, the differences between ETs and participatory tools is only mentioned twice (glossary and 4.1.1 Theoretical background), but not anymore in Results/Discussion.



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Reviewer x8 : Yes

RESPONSE: Thank you!

Reviewer x9 : The discussion is quite in line with the request and supported by the results, although some aspects could have been better targeted. The focus on coastal communities and related specificities is at times not evident, for example in section 6.2. The overall feeling is that all the important elements are there, but the report lacks a clear framework to organise them. A more in-depth conceptualization of the links between NbS, ETs, coastal challenges, and resilience could have been proposed to frame the overall search and help structuring the results. An example of this is the concept of resilience, a key term in the formulation of the request, which suggests that the requesters already had an idea of what they meant with this term. However, a clear definition of resilience in the context of this request, i.e. resilience of coastal communities, is missing. It is true that resilience is a quite contested concept, but the lack of a (working) definition and conceptualization represents a weak point of the analysis. The fact that empowerment is considered a dimension of resilience is stated only in Table 1. After revealing that most publications do not include an explicit definition of resilience (section 5.2), the results (section 5.3.6) link the topic of NbS to different “categories of resilience” defined bottom-up based on the analysed literature. But the different categories are never taken up again in the rest of the analysis. The link between resilience and empowerment tools is not explicitly explored in sections 5.4 and 5.5 (which should respond to specific objectives 2 & 3), so the purpose of defining the categories of resilience remains unclear. In 6.4.2 the authors mention specific individual and collective attributes linked to resilient coastal communities, but such attributes are never explained, and it is not clear if they overlap with the “features” listed in Table 5.

RESPONSE: Thank you for your feedback! This response is divided in different sections to improve readability.

- 1. In section 6.2 (as well as the Introduction), we have added more links to the specificities of NbS in addressing coastal challenges in Europe with examples of applications.*
- 2. To better represent the links between NbS, ET, coastal challenges and resilience, we improved Figure 5 in the Methods, and created Figure 30 in the section 6.4.2 of the Discussion.*
- 3. A clear definition of resilience in the context of the request is provided in Introduction.*
- 4. Empowerment as a dimension of resilience is explained more in depth in 4.1.1. Theoretical background, and discussed in 6.4.2*
- 5. We have erased section 5.3.6 about the categories of resilience, and included specific examples of NbS applications and approaches in Europe across the section 5.3.*
- 6. In 6.4.2, it is explained better that the individual and collective attributes are related/overlap with the features mentioned in Table 5. Also the content of this table has been expanded including concrete examples of these features.*

Reviewer x10 : Yes it does.

RESPONSE: Thank you!

Reviewer x11 : The discussion in the document does address the question of the request, which is: “How community empowerment tools and nature-based solutions can contribute to addressing coastal challenges and building resilient communities.” Here’s how the discussion aligns with the request:



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- **Community Empowerment Tools (ETs):** The document discusses the importance of empowering coastal communities to tackle societal challenges and co-create solutions for sustainable, resilient, and inclusive coastal regions. It emphasises the need for bottom-up (community scope) and top-down (political scope) interventions to drive positive societal transformations. This aligns with the aspect of using community empowerment tools to address coastal challenges.
- **Nature-based Solutions (NbSs):** The document also highlights the significance of Nature-based Solutions (NbSs) in addressing coastal challenges effectively and adaptively. It describes NbSs as actions to protect, manage, and restore ecosystems to provide both human well-being and biodiversity benefits. Additionally, it discusses the importance of engaging communities in implementing NbSs and emphasises the role of Living Labs in testing and validating these solutions. This aligns with the aspect of using nature-based solutions to address coastal challenges.
- **Synthesis of NbSs and ETs:** The document synthesises the scope and characteristics of the joint application of NbSs and ETs for coastal resilience building. It critically assesses the outcomes and impacts of such interventions in fostering empowerment. By exploring how these two approaches can work together, the document addresses the question of how both community empowerment tools and nature-based solutions can contribute to building resilient communities. Moreover, the discussion part of the report deals both with the qualitative and quantitative data (needed for the Empower Us project) as derived from the literature without underestimating any of them.

RESPONSE: *Many thanks for your summarising points, we used the structure when providing the Executive summary*

Reviewer x12 : The report's concluding section explicitly states its objective as "providing the first evidence-based knowledge on the contribution that NbS and empowerment tools can make to the resilience of coastal communities".

Suggesting areas for improvement in the discussion section:

- The discussion acknowledges the lack of research on measuring empowerment outcomes. It could be strengthened by delving deeper into this limitation.

1. Discussing different theoretical frameworks of empowerment relevant to the context.
2. Exploring potential challenges in measuring empowerment within NbS projects (e.g., subjective nature of perceptions).
3. Proposing recommendations for future research on developing robust methods for empowerment assessment.

- The discussion could be strengthened by acknowledging potential limitations of the reviewed studies:

1. Geographical focus of the studies and potential need for broader geographical representation.
2. Potential biases in the selection of reviewed studies and the need for further research to address these.



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- Beyond the general call for more research and innovation, the discussion could offer specific recommendations for future research directions:

1. Research on long-term impacts of NbS and ET projects on community empowerment and resilience.
2. Development of case studies that showcase successful examples of co-creation in NbS projects.

RESPONSE: *Thanks for your remark. More on the potential limitations of the reviewed publications and volumes found was added to the discussion section (in section 6.1). The theoretical frameworks of NbS, resilience, empowerment, and other key terms relevant to the request can be found in a Background section (2.1). Finally, the recommendations were splitted in two: for research, and for policy and decision-making. In regard to the former, the points suggested about methods for empowerment outcomes and measuring long-term impacts were included as research recommendations.*

Reviewer x13 : Yes, the content of the report addresses the objective posed in the research question.

RESPONSE: *Thank you for your feedback!*

Does the conclusion address the question of the request and are the recommendations supported by the results presented in the report?

Reviewer x1 : *no comment*

Reviewer x2 : Yes, the conclusion addresses the question of the requests, and recommendations are supported with results presented in the report for the survey.

RESPONSE: *Thank you.*

Reviewer x3 : yes, it does

RESPONSE: *Thank you.*

Reviewer x4 : Yes, the conclusions in Section 6 (pages 55-57) directly address the key questions of the request. The conclusions summarise the main findings and recommendations, which are well-supported by the results and evidence presented throughout the report. For example, the recommendation to integrate NbS and empowerment tools for building resilient coastal communities (Section 6.1, page 55) is based on the evidence synthesis in Sections 3.1 and 3.2, as well as the case studies in Section 4. The recommendation to involve local communities and stakeholders (Section 6.2, page 56) is supported by the evidence on the importance of community participation and co-creation (Section 3.2.2, pages 26-27) and the case study examples (Section 4).



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RESPONSE: Thank you for your feedback!

Reviewer x5 : While detailed recommendations and conclusions are provided, they seem not to be specifically aligned with the focus on Europe and high-income countries and territories.

RESPONSE: Thank you for your remark. We have taken it into account. For instance, some recommendations are given in regards to protection against coastal natural hazards by using NbS, as this topic is very common at the European level and in the context of climate change. Recommendations were also splitted in two: for research, and for policy and decision-making. These target different audiences, in the former case, the EmpowerUs researchers and other scientists, and in the latter case, government agencies managing the TCLs and other Living Labs across Europe.

Reviewer x6 : The conclusions chapter explains the whole particularly well.

RESPONSE: Thank you for your feedback!

Reviewer x7 : Some conclusion's arguments are redundant to the one reported in the results and discussion. I hence encourage carefully revising the conclusion to ensure another layer of reflection is provided.

RESPONSE: Thank you for your feedback! We have checked and reworked the Conclusion and other parts and made sure there are no repetitions. For instance, the differences between ETs and participatory tools is only mentioned twice (glossary and 4.1.1 Theoretical background), but not anymore in Results/Discussion.

Reviewer x8 : Yes

RESPONSE: Thank you!

Reviewer x9 : The recommendations and conclusions are certainly relevant to the request and raise important issues. The extent to which they are based on the results is sometimes hard to judge, as the results are mostly focused on quantitative aspects and a more qualitative way of synthesising them, e.g. by clustering case studies or presenting common findings in terms of opportunities and barriers, has not been given the same relevance.

RESPONSE: As most types of literature reviews, we used a mixed of quantitative and qualitative analyses to provide answers and recommendation to different questions, from more general to more specific. In the case of qualitative analysis, an in-depth content analysis was conducted on 24 studies with evidence of empowerment and addressing NbS+ET, to extract methods/indicators to measure empowerment and/on the impacts (outcomes) of those empowerment actions in the communities analysed. Also, to extract a list and develop a classification scheme of ET, content analysis was performed and many examples of applications and their impact on communities were reported throughout the results and discussion sections. In such regards, recommendations like the need to measure the performance/impact of NbS in fostering empowerment and the links with resilience is based on a cluster of case studies in which qualitative approaches were used.

Reviewer x10 : Of course, it does. But the conclusion should be nuanced, of course the NbS is not the only solution to solve the rapidly changing coastal landscape problems; some countries are still adopting Engineering based-solutions.



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RESPONSE: Thank you for your remark. We have additionally outlined the importance of engineering-based solutions in the Introduction.

Reviewer x11 : The conclusion underscores the importance of integrating NbS and ET approaches to enhance resilience in coastal communities while emphasising the need for further research, innovation, and policy action to support transformative change. It does so by a) Addressing the Question: The conclusion summarises the findings related to the roles of nature-based solutions (NbS) and empowerment tools (ETs) in promoting coastal community resilience. It discusses the importance of both NbS and ETs in fostering resilience, highlighting their potential contributions to addressing coastal challenges. Additionally, it underscores the need for further research, innovation, and policy action to support transformative change in coastal communities. b) Support from Results: The recommendations provided in the conclusion are supported by the results presented in the report. For example: - The recommendation to focus on systemic thinking and integrate social and natural sciences aligns with the finding that resilience requires understanding socio-ecological dynamics. - The emphasis on community-led nature-based approaches as empowerment tools is supported by the identification of NbS projects with participatory and engagement processes. - The recommendation for further research on measuring empowerment outcomes aligns with the finding that existing studies lack methodologies for assessing empowerment linked to coastal resilience. - The call for policy recommendations to support joint NbS and ET approaches corresponds to the identification of gaps in current governance models for implementing such strategies.

RESPONSE: Thank you for your feedback!

Reviewer x12 : The report's concluding section proficiently tackles the overall research query that corresponds with the primary inquiry that was investigated throughout the study. However there are areas for improvement. I am listing them as:

- Currently, the connection between the identified gaps/challenges and the proposed recommendations is somewhat broad. For instance, the conclusion could explicitly link each recommendation to a specific gap or challenge identified in the discussion section.

- While the report offers recommendations, consider reframing them in the conclusion to emphasise actionable steps. For instance, instead of simply calling for "increased research," we can specify the research areas that require the most focus, e.g., "conducting longitudinal studies to assess the long-term impacts of NbS and ET projects on community empowerment and resilience".

Also, for policy changes, we can consider suggesting specific policy mechanisms or frameworks that could be implemented at the EU level.

RESPONSE: Thanks a lot for your suggestions. Recommendations were splitted in two: for research, and for policy and decision-making. We suggest some suitable policy frameworks for the EU like the upscaling of coastal Living Labs, as this is quite a common and accepted mechanism that can foster empowerment, and therefore, resilience. We also highlighted the need to "implement common strategies (and legislation frameworks) at the EU level for the design, implementation, assessment and maximisation of joint NbS and ET approaches" as a key recommendation.

Reviewer x13 : Yes. As I mention later, I only miss a differentiated treatment and a certain greater emphasis on the recommendations for policy-makers



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RESPONSE: *Thanks a lot for your suggestions. Recommendations were splitted in two: for research, and for policy and decision-making. Other key recommendations were added in the Conclusions section, which should call the attention of policy and decision-makers.*

Does the report represent a comprehensive evidence synthesis under the topic of “Building resilient coastal communities through Nature-based Solutions and Empowerment Tools? If not please provide further information.

Reviewer x1 : *no comment*

Reviewer x2 : *Yes, the report provides a comprehensive evidence synthesis under the defined topic, and framework.*

RESPONSE: *Thank you!*

Reviewer x3 : *yes*

RESPONSE: *Thank you!*

Reviewer x4 : *Yes, the report provides a comprehensive evidence synthesis on the topic of building resilient coastal communities through nature-based solutions (NbS) and empowerment tools. The report covers a wide range of relevant aspects, including: - Definition and benefits of NbS (Section 3.1, pages 15-24) - Definition and types of empowerment tools (Section 3.2, pages 24-29) - Case studies demonstrating the application of NbS and empowerment tools (Section 4, pages 25-42) - Discussion on the integration of NbS and empowerment tools (Section 5, pages 43-54) - Conclusions and recommendations (Section 6, pages 55-57) The report draws upon a diverse range of sources, including peer-reviewed literature, reports from international organisations, and case studies from various coastal regions around the world. The evidence synthesis appears to be comprehensive and covers the key aspects of the topic.*

RESPONSE: *Many thanks for your feedback!*

Reviewer x5 : *Yes it does. However, it will be good to stipulate the software used to screen the articles or specifically how that was achieved.*

RESPONSE: *Thank you for your concern. However, we did not employ any software to screen the articles. Like it is reported in the Methods section, articles were screened in two phases: one by reading the abstracts, and the second one, by doing full-content analysis.*

Reviewer x6 : *Yes. From a practitioner/policy maker perspective some parts miss a little explanation, or a resuming or concluding sentence in common language, or opening an example that can make the whole more accessible. In*



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summary, can you provide a 1-3 sentence answer to each objective? The boxes could also highlight some concrete examples. For example, provide the examples from Table 5 if they are related to a specific case/environment.

RESPONSE: *Many thanks for your feedback and suggestions. A major revision of text was conducted to improve readability for all target audiences avoiding technical terms when possible. Boxes were also added, e.g., to explain the classification of NbS approaches. Content in Table 5 was also expanded to include more concrete examples of these features in resilient social-ecological systems. The Executive summary contains a brief answer to each objective.*

Reviewer x7 : It does collect a considerable amount of evidence. Nonetheless, further efforts should be made to interpret the collected knowledge in order meet the requester knowledge needs (See comment for the first question of this form).

RESPONSE: *Many thanks for your feedback. We addressed the comment in the first question of this form.*

Reviewer x8 : Yes

RESPONSE: *Thank you!*

Reviewer x9 : The analysed publications seem to offer a comprehensive overview of existing findings about the topic, both in the scientific and the grey literature. Some conceptual aspects could have been elaborated more, with benefits in terms of structure of the information in the report (see previous comments).

RESPONSE: *We thank the reviewer for this comment. We have added a theoretical background subsection in the Methods section for clarification.*

Reviewer x10 : Yes , to some extent.

RESPONSE: *Thank you!*

Reviewer x11 : The report seems to represent a thorough examination of the topic, covering various aspects related to building resilience in coastal communities through nature-based solutions and empowerment tools. All of the report parts are needed, clear, well-supported and adequately structured. My only recommendation would be to add some more references from humanities and social sciences (e.g. Geography, Political Ecology) in order to avoid over-representation of physical sciences literature on the field.

RESPONSE: *Thank you for your remark! Unfortunately, the screening method chosen does not allow us to add new articles (we mentioned this in the limitations of the method). However, in the main part of the report we tried to expand the range of articles we refer to and added more social science-related ones.*

Reviewer x12 : To the best of my understanding within the given time, I believe that while the report provides a valuable contribution to the discussion on creating resilient coastal communities through NbS and ET, it falls slightly short of being a fully comprehensive evidence synthesis. This is due to a few reasons:

- One area where the report could enhance its comprehensiveness is by providing more information about the methodology used to select the reviewed studies. This transparency is crucial as it allows for a thorough



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assessment of the report's comprehensiveness and potential biases, such as the exclusion of certain studies or the overrepresentation of specific perspectives.

- The potential geographical limitations of the reviewed studies are not addressed. A comprehensive evidence synthesis would ideally consider research from a broader range of coastal regions. This broader scope strengthens the generalizability of the findings.
- The report acknowledges the importance of empowerment but lacks a deeper analysis. Exploring various theoretical frameworks of empowerment relevant to the NbS and coastal community context could provide a richer understanding. Plus, investigating challenges in measuring empowerment within NbS projects would offer valuable insights.
- While the report mentions various combinations of NbS and ET approaches, it could delve deeper into which NbS approaches are most frequently paired with specific ET categories. Analysing the reasons behind these pairings and their effectiveness in different contexts would strengthen the report's contribution.

RESPONSE: *Thank you for your feedback. This response is divided in different sections to improve readability.*

1. *The method used to conduct this review was reported using the PRISMA protocol which has very high transparency standards. However, some inserts and clarifications were added in the methods section to explain better the search, screening and extraction of the evidence.*
2. *More on the potential geographical limitations of the reviewed publications found was added to the discussion section in 6.1.1.*
3. *We have added a theoretical background subsection in the Methods section including the theory behind the empowerment concept. The need to measure empowerment processes is addressed in Results, Discussion and Conclusions.*
4. *Section 6.4.1 initiated with a brief discussion about the reason behind combination of NbS+ET approaches*

Reviewer x13 : Yes, especially in the area of literature based in scientific journals. Obviously, it's more difficult to cope with the so-called "grey-literature". In this sense, I would like to make a general observation about the report: perhaps specific treatment could be given to the analysis of "non-scientific" references since they are of a different nature, in the sense that they can include guidelines, methodological approaches to implement NBS, etc., generally oriented to policy-makers, decision-makers, technicians and the general society, not being, therefore, evaluation documents of previous works.

RESPONSE: *Thank you for your suggestion. The grey literature was given a different treatment as documents were selected only if they provided evidence of empowerment outcomes and/or the methods to measure them, not about NbS and empowerment tools in general. We were aware that most grey-literature documents summarise primary data; thus to avoid overrepresentation, we used more strict criteria. This is explained in 4.2.3.2.*



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EMPOWERUS REQUEST

Are appropriate and up-to-date peer-reviewed references used in the report? Do you know of any additional references, or examples which the report should mention (please be as precise as possible and provide references)?

Reviewer x1 : *no comment*

Reviewer x2 : No, the methodology utilised to collect references for this report is categorical, and does ensure to take care of including all the required references without duplicating them.

RESPONSE: *Thank you!*

Reviewer x3 : yes, they are appropriate

RESPONSE: *Thank you!*

Reviewer x4 : The report cites a wide range of peer-reviewed references from various disciplines, including coastal management, environmental science, social sciences, and urban planning. The references appear to be appropriate and up-to-date, with many citations from the past 5-10 years. However, I would suggest including a additional references that could further strengthen the evidence synthesis: 1. Narayan, S., Beck, M. W., Reguero, B. G., Losada, I. J., van Wesenbeeck, B., Pontee, N., ... & Burks-Copes, K. A. (2016). The effectiveness, costs and coastal protection benefits of natural and nature-based defences. *PLoS One*, 11(5), e0154735. This paper provides a comprehensive analysis of the effectiveness and cost-benefits of nature-based solutions for coastal protection. 2. Denton, F., Wilbanks, T. J., Abeyasinghe, A. C., Burton, I., Gao, Q., Lemos, M. C., ... & Warner, K. (2014). Climate-resilient pathways: adaptation, mitigation, and sustainable development. In *Climate Change 2014 Impacts, Adaptation and Vulnerability* (pp. 1101-1131). Cambridge University Press. This chapter from the IPCC report discusses the importance of integrating adaptation, mitigation, and sustainable development for building climate resilience, which is relevant to the topic of the report. 3. Ayers, J., & Forsyth, T. (2009). Community-based adaptation to climate change. *Environment: science and policy for sustainable development*, 51(4), 22-31. This article provides insights into community-based adaptation approaches, which are relevant to the discussion on empowerment tools and community participation.

RESPONSE: *Thank you very much for the references provided. We have taken them into consideration, however, in the end we did not include any of them.*

Reviewer x5 : Yes they are as majority of the references are within the last five years. However, you can consider using any of the following which seems appropriate for the report:

Ortiz Vargas, A., Pirazan-Palomar, L., Renaud, F.G., Sandholz, S., Sebesvari, Z., Sudmeier-Rieux, K., Walz, Y. (2023); Towards a typology of nature-based solutions for disaster risk reduction, *Nature-Based Solutions*, Volume 3, 100057, ISSN 2772-4115. <https://doi.org/10.1016/j.nbsj.2023.100057>.

Unguendoli, S., Germano Biolchi, L., Aguzzi, M., Pillai, U.P.A., Alessandri, J., Valentini, A., (2023): A modeling application of integrated nature based solutions (NBS) for coastal erosion and flooding mitigation in the Emilia-



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EMPOWERUS REQUEST

Romagna coastline (Northeast Italy). *Science of The Total Environment*, Volume 867, 2023, 161357, ISSN 0048-9697, <https://doi.org/10.1016/j.scitotenv.2022.161357>.

Dubo, T., Palomo, I., Camacho, L.L. et al. (2023): Nature-based solutions for climate change adaptation are not located where they are most needed across the Alps. *Reg Environ Change* 23, 12. <https://doi.org/10.1007/s10113-022-01998-w>.

Mabrouk, M., Han, H., Fan, C., Abdrabo, K.I., Shen, G., Saber, M., Kantoush, S.A., Sumi, T., (2023): Assessing the effectiveness of nature-based solutions-strengthened urban planning mechanisms in forming flood-resilient cities, *Journal of Environmental Management*, Volume 344, 118260, ISSN 0301-4797, <https://doi.org/10.1016/j.jenvman.2023.118260>.

Rosanna van Hespen, Zhan Hu, Bas Borsje, Michela De Dominicis, Daniel A. Friess, Svetlana Jevrejeva, Maarten G. Klein Hans, Maria Maza, Celine E.J. van Bijsterveldt, Tom Van der Stocken, Bregje van Wesenbeeck, Danghan Xie, Tjeerd J. Bouma, (2023): Mangrove forests as a nature-based solution for coastal flood protection: Biophysical and ecological considerations, *Water Science and Engineering*, Volume 16, Issue 1, Pages 1-13, ISSN 1674-2370, <https://doi.org/10.1016/j.wse.2022.10.004>.

RESPONSE: *Thank you very much for the references provided! We have taken them into consideration and included some of them across the text.*

Reviewer x6 : *no comment*

Reviewer x7 : Some references used to introduce and describe NBS are not the most updated. I suggest to use the following reference for the NBS definition: • UNEP. 2022. "Nature-Based Solutions for Supporting Sustainable Development." United Nations, 3–5. • UNFCCC. 2023. "Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement- Outcome of the First Global Stocktake." Vol. 24993.

And for the description of NBS typologies: • Castellar, J. A.C., L. A. Popartan, J. Pueyo-Ros, N. Atanasova, G. Langergraber, I. Säumel, L. Corominas, J. Comas, and V. Acuña. 2021. "Nature-Based Solutions in the Urban Context: Terminology, Classification and Scoring for Urban Challenges and Ecosystem Services." *Science of the Total Environment* 779: 146237. <https://doi.org/10.1016/j.scitotenv.2021.146237>.

Other relevant missing references regarding the topic of empowerment tools and the transformative potential of NBS are the following: • Palomo, Ignacio, Bruno Locatelli, Iago Otero, Matthew Colloff, Emilie Crouzat, Aida Cuni-Sanchez, Erik Gómez-Baggethun, et al. 2021. "Assessing Nature-Based Solutions for Transformative Change." *One Earth* 4 (5): 730–41. <https://doi.org/10.1016/j.oneear.2021.04.013>. • Wittmer, Heidi, A Berghöfer, Büttner L, R Chakrabarty, J Förster, S Khan, C König, et al. 2021. "Transformative Change for a Sustainable Management of Global Commons – Biodiversity, Forests and the Ocean . Recommendations for International Cooperation Based on a Review of Global Assessment Reports and Project Experience." <https://doi.org/10.57699/7s83-7z35>.

RESPONSE: *Thanks for your suggestions. For the concept of NbS we used in the end the following: "El Harrak, M., & Lemaitre, F. (2023). European Roadmap to 2030 for Research and Innovation on Nature-based Solutions. NetworkNature" which is more updated. The other references that were suggested were included in the text.*



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Reviewer x8 : To my knowledge, yes. If the terminology was “wider”, including e.g., co-management of “good governance” which are terms widely used in the coastal/fisheries context referring to much of the same processes, this would have included the work of for instance Svein Jentoft and others. Pinkerton and Berkes (referred to in the report) belongs to the same “cohort”.

RESPONSE: *Thank you for your remark! Though, we tried to limit the amount of keywords in the end to avoid overrepresentation of studies and to comply with the timeframe of the requester.*

Reviewer x9 : Nothing to add.

RESPONSE: *Thank you!*

Reviewer x10 : Ecological engineering to mitigate eutrophication in the flooding zone of river Nyong, Cameroon; 2021

RESPONSE: *Thank you for your suggestion, but we tried not to include case studies from regions outside Europe or non-OECD countries (high income), so our findings were relevant to the requester.*

Reviewer x11 : I am not able to provide any additional references as my field of expertise is slightly different. Nevertheless, the report compiles an extensive bibliography covering a wide range of topics related to environmental management, climate change adaptation, community engagement, and more while diversifying the sources (including journal articles, reports, grey literature) and online resources. I would insist a bit more on “Empowerment Tools and Participatory Approaches”: Seek out literature on community empowerment tools, participatory planning methods, and approaches to engaging local stakeholders in resilience-building efforts. This may include studies on community-based natural resource management, participatory mapping, and citizen science initiatives.

RESPONSE: *Thank you very much for the suggestions provided! The screening references can't be supplemented after the screening is done, due to the method's limitations. However, we have included more references from the social sciences to enrich the discussion and other sections.*

Reviewer x12 : No comment

Reviewer x13 : The researchers provide an exhaustive review of the literature. I detect a slight inconsistency between the number of works reflected on page 27 (5.1.1) and the number of references (page 116 and so on): 202 scientific studies compared to 215 references, and 16 "grey-literature" studies comprised to fifteen

RESPONSE: *Thank you for your comment. We reworked the inconsistencies. The correct number is 202 (scientific literature) and 16 (grey literature).*



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EMPOWERUS REQUEST

Are the figures appropriate and helpful? What improvements would you suggest; e.g. is the number of figures helpful or should some be removed; are the figures supported by appropriate text?

Reviewer x1 : no comment

Reviewer x2 : Yes, the figures are helpful but Figure 31 which mentions exploring knowledge, but knowledge exploration should be guided towards a better climate and solution for all, and should explore towards enhancing the local farming, and local businesses for the community.

RESPONSE: Thank you for your suggestion. Since Figure 31 (now Figure 28) is a summary figure, the part related to “knowledge” does not address specific challenges like climate change, but the need to measure empowerment in communities through long-term longitudinal studies. However, specific knowledge needs in relation to climate change risks are mentioned throughout the text.

Reviewer x3 : none, they are ok

RESPONSE: Thank you!

Reviewer x4 : The report includes several figures (Figures 1-6) that are generally appropriate and helpful in visualising the key concepts and findings. The figures are well-supported by the accompanying text in the respective sections. However, I would suggest the following improvements: 1. Figure 2 (page 17): This figure illustrates the benefits of nature-based solutions, but it could be made more visually appealing and easier to understand. The current version appears cluttered and may be difficult to interpret for some readers. 2. Figure 4 (page 30): This figure shows the different types of empowerment tools, but it could benefit from additional explanations or examples in the text to clarify the distinctions between the different categories. 3. Consider adding a new figure: The report could benefit from a figure that visually represents the integration of nature-based solutions and empowerment tools for building resilient coastal communities. This could help readers better understand the message and recommendations of the report.

RESPONSE: Thanks for your suggestions. We have created a Figure 30 in the section 6.4.2 of the Discussion to explain the links of NbS and ETs in the context of coastal social-ecological systems. The figure about empowerment tools was not modified and left as it was, but different concepts and examples of these categories are mentioned in sections 5.4.4 and Table 3.

Reviewer x5 : I have the following observations for the figures: Figure 2: the Broad Public Dissemination icon is not clear. Also, since the figure title is under, the sentence on top i.e The process of answering a request, should be removed. Figure 5: In the title, the words “public participation” were repeated. Figure 6: 16 Records excluded for other reasons not just reason Figure 10 and Figure 16 seem like a duplication. You can consider removing one of them. Figure 14 in my opinion is not necessary. A sentence will suffice.

RESPONSE: Thanks for your suggestions. Figures’ resolutions will be improved in the final version. Figures 10, 14 and 16 were removed. Figure 6 was fixed.



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EMPOWERUS REQUEST

Reviewer x6 : See comments in each section. Mostly useful with little improvements.

RESPONSE: *Thank you for your comments.*

Reviewer x7 : The size of the figures should be adjusted to have a more balanced proportion between the graph and the text in the labels.

The content of figure 5 is difficult to read while it is crucial for the method description.

Figure in page 67 lacks the caption.

The results of Figure 17.b are not very clear.

The category of “two phases” in Figure 21 is not clear.

RESPONSE: *Thanks for your suggestions. Figures’ resolutions will be improved in the final version. Figure 5 (now Fig. 4) was replaced with a clearer version. Caption was added to the figure in the box. Figure 17b (now 14b) and Figure 21 (now Fig. 18) were clarified.*

Reviewer x8 : all figures are relevant and helpful. The size of figure 1 should be bigger/format improved.

RESPONSE: *Thank you for your comment! The figure size has been improved*

Reviewer x9 : Some graphs repeat information that is also described in the text. The simplest ones can be removed (e.g., figures 14, 15, 29). Figure 1 should probably be cropped. Figure 4 could be turned upside-down, as we usually read diagrams from top to bottom. Figure 9 could be converted into a different type of graph (perhaps a Venn diagram). The font size in figures 30 and 31 should be increased.

RESPONSE: *Thanks for your suggestions. Simpler graphs like Figures 10, 14 and 16 were removed. Resolution is improved for all figures. Fig. 4 (now Fig. 5) is turned upside down. Fig. 9 (as well as Fig. 13) was converted to a Venn Diagram.*

Reviewer x10 : Yes, of course

RESPONSE: *Thank you!*

Reviewer x11 : There are no comments on the figures as all of them are clear and helpful. I guess the graphic quality will be optimized in a later draft.

RESPONSE: *Thank you! The graphics have been optimised in the final version.*

Reviewer x12 : I think that including figures and infographics in reports can be a really effective way to make complex information more accessible and engaging for the reader. Therefore, I believe that the figures presented in the report are suitable, beneficial, and contribute to an unambiguous and effective presentation of the information.

RESPONSE: *Thank you!*

Reviewer x13 :The illustrations are very illustrative and representative of the concepts developed in the text.



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EMPOWERUS REQUEST

RESPONSE: Thank you for your feedback!

Are the tables appropriate and helpful? What improvements would you suggest? E.g. are the main findings supported by the results included in the report.

Reviewer x1 : no comment

Reviewer x2 : Maybe improvements could be towards thinking about circular economy, and including discussions, and results to focus towards having circular economy.

RESPONSE: Thanks for the suggestion. Although the circular economy is aligned with the principles of resilience, it was out of scope in the context of our request.

Reviewer x3 : none, they are ok

RESPONSE: Thank you!

Reviewer x4 : The report includes several tables (Tables 1-4) that are generally appropriate and helpful in presenting the key findings and evidence from the literature review and case studies. Table 1 (page 16) provides a clear overview of the different types of nature-based solutions, which is useful for readers who may be unfamiliar with the concept. Table 2 (page 25) summarises the case studies included in the report, which helps readers quickly understand the geographic and thematic scope of the case studies. Table 3 (page 31) and Table 4 (page 32) present the results of the literature review on empowerment tools, which are well-supported by the evidence synthesis in Section 3.2. One potential improvement could be to consider combining Tables 3 and 4 into a single table, as they cover related aspects of empowerment tools. This could make it easier for readers to compare and contrast the different types of empowerment tools and their respective characteristics.

RESPONSE: Thank you for your suggestion. Although both tables are related, Table 3 is more comprehensive in regard to examples and classification of empowerment tools, methods and approaches. Explanation of each category and actions within each category are provided in the text above. Table 4 is in the Discussion and provides a summary of ET categories as a take-home message.

Reviewer x5 : The tables are okay.

RESPONSE: Thank you!

Reviewer x6 : Table 5 - Although these are common features, can you provide information on examples, if they are related to specific cases/scale/environments or if there is a case where the key feature was applied.

RESPONSE: Thank you for the suggestion. The content of this table has been expanded including concrete examples of the different features.



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Reviewer x7 : *no comment*

Reviewer x8 : Yes

RESPONSE: *Thank you!*

Reviewer x9 : Yes, tables are appropriate and informative. Table 4 could perhaps be moved to the conclusions or deleted, as it just repeats contents already presented in the results.

RESPONSE: *Thanks for the comment. The discussion and conclusion sections are usually targeted by policymakers in these types of documents, and Table 4 provides a summary of ET categories and descriptions of actions, which might be helpful as a take-home message.*

Reviewer x10 : Yes .

RESPONSE: *Thank you!*

Reviewer x11 : There are no comments on the tables as all of them are clear and helpful.

RESPONSE: *Thank you.*

Reviewer x12 : *no comment*

Reviewer x13 : Yes

RESPONSE: *Thank you!*

Is the text and writing style easy to follow and understand (i.e. self-explanatory, free of jargon)? If not, where do you see a need for language revision, or more clarity? Please indicate any suggestions in the sections concerned with the page and line numbers.

Reviewer x1 : *no comment*

Reviewer x2 : Yes, the text is clear and concise, easy to understand for any one.

RESPONSE: *Thank you for your feedback*

Reviewer x3 : yes, it seems ok to me. I ma not native speaker, so can not really say, maybe would be good idea to lecturer goes through the document before submitted

RESPONSE: *Thank you for your remark*



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Reviewer x4 : The text and writing style of the report are generally easy to follow and understand. The language is clear and straightforward, avoiding excessive use of jargon or technical terms that might be difficult for a general audience to comprehend. However, there are a few sections where the text could benefit from some language revision or additional clarity: 1. Section 5.4 (Objective 2) Nexus between ETs and coastal challenges and resilience (pages 24-29): - The discussion on “Empowerment Outcomes” (page 28) could be expanded with more specific examples or clearer explanations to aid understanding. - Example: On page 28, lines 10-12, the sentence “Empowerment outcomes can be viewed as both a means to an end, as well as an end in itself, depending on the context and objectives of the intervention” could be clarified with an example or further elaboration. 2. Section 6.3. Specific Objective 2 (pages 46-50): - Some parts of this section could benefit from additional clarity or examples to better explain certain concepts or terms related to empowerment tools. - Example: On page 48, lines 5-7, the sentence “Empowerment tools can also be designed to foster transformative change, challenging existing power structures and promoting more equitable and inclusive decision-making processes” could be made clearer by providing an example of how an empowerment tool might achieve this. 3. Section 5.5 (Objective 3) Links between NbSs and ETs and empowerment outcomes (pages 29-42): - While the use of case studies helps to illustrate the concepts, some of the case study descriptions could benefit from clearer language or more detailed explanations. - Example: On page 35, lines 15-18, the description of the “Living Shorelines” project in Alabama could be made more clear by additional context or explaining some of the terms used (e.g., “living shorelines,” “marsh restoration”).

RESPONSE: *Many thanks for your feedback, we have taken some of your comments into consideration in the final report.*

Reviewer x5 : The first two paragraphs of Box 1. The Living Lab approach and its importance to anchor NbSs is a bit technical for general understanding.

RESPONSE: *Thanks for the suggestion. The connections of the Introduction with Box 1 have been improved to make more explicit the role of TCLs as requesters. Also, the text of the box has been improved for readability.*

Reviewer x6 : Overall very clear and concise - different sections vary due to their purpose.

The results-section is heavy to read due to many brackets, references and numbers. But for someone who looks for the application of the results, it's not the most central chapter.

4.2.3.5 difficult language 5.5.1 difficult to understand content - this is related to page 17 Could you open the specific objective 3 in an understandable language?

RESPONSE: *Thanks for the feedback. We have improved the readability of these sections. The objective 3 is clearer and Table 1 provides a more in-depth explanation of what it means.*

Reviewer x7 : *no comment*

Reviewer x8 : I find the report easy to read and logical in the way it is built up.

RESPONSE: *Thank you!*

Reviewer x9 : The text is easy to read and understand. There is no need for language revision.



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EMPOWERUS REQUEST

RESPONSE: Thank you!

Reviewer x10 : It's ok.

RESPONSE: Thank you!

Reviewer x11 : The language/vocabulary is overall simple and understandable, allowing the reader to follow it.

RESPONSE: Thank you!

Reviewer x12 : No comment.

Reviewer x13 : Yes

Title (Cover page)

Reviewer x1 : no comment

Reviewer x2 : ADDRESSING COASTAL CHALLENGES AND BUILDING RESILIENT COMMUNITIES UTILISING Nature Based Solutions (NBS), and Community Empowerment.

RESPONSE: Thank you for the suggestion, but we had to stick with the original title used by the requesters.

Reviewer x3 : no comment

Reviewer x4 : The title "Building resilient coastal communities through Nature-based Solutions and Empowerment Tools' is clear and accurately reflects the main topic of the report.

RESPONSE: Thank you!

Reviewer x5 : For the following: HOW COMMUNITY EMPOWERMENT TOOLS AND NATUREBASED SOLUTIONS (NBS) CAN CONTRIBUTE TO ADDRESSING COASTAL CHALLENGES AND BUILDING RESILIENT COMMUNITIES? I don't think it should end with a question mark since it is not a question.

RESPONSE: Thank you for the remark. A title in question format is usually used in the Eclipse process as it is formulated by a (usually) policy-side requester.

Reviewer x6 : no comment

Reviewer x7 : no comment

Reviewer x8 : Yes



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EMPOWERUS REQUEST

RESPONSE: Thank you!

Reviewer x9 : If the title is a question, it should be formulated as “How can community?”.

RESPONSE: Thanks. We have taken this into consideration for the full title of the request.

Reviewer x10 : Ok.

RESPONSE: Thank you!

Reviewer x11 : No change needed.

RESPONSE: Thank you

Reviewer x12 : no comment

Reviewer x13 : I suggest that the title have a subtitle: a study based on the analysis of the literature, or something similar

RESPONSE: Thank you. However, as other Eclipse documents, we stuck with the original title in a question format.

Glossary

Reviewer x1 : Co-creation: Perhaps add a published definition here rather than refer to the GA.

Community Empowerment: This is an interesting definition of Empowerment - though I think some key elements are missing - however, in your review you really only focus on empowerment as increased levels of participation, see Table 3 for example. In the project, we view empowerment as something that enables communities to reformat structures or to increase their capacity to act in ways they could not act before. We are drawing very much on the transition management literature here - but also theories of power. I wonder if your definition can be expanded to include structure and agency more explicitly.

Empowerment Tools (ETs) - “self-efficacy, autonomy, and active participation of individuals or communities in decision-making processes.”: But in Table 3 you really only focus on the ‘participation’ aspect.

RESPONSE: Thanks for the feedback. Co-creation definition was updated to Mauser et al. (2013) & Hakkarainen et al. (2021). In regard to the definition of (community) empowerment, although many definitions are around, I think the one we chose includes terms related to agency (e.g., decision authority) and structure (e.g., access and power over resources). In addition, we think that Table 3 does not only describe ET in terms of increased participation level. The Bobbio (2019) scale used relates to community engagement, and some of our tools, like community-based NbS and co-creation tools cover aspects beyond participation, including agency, which truly reflect empowerment.



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Reviewer x2 : n/a

Reviewer x3 : Co-creation - the table does not look ok

RESPONSE: Thank you! Co-creation definition was updated to Mauser et al. (2013) & Hakkarainen et al. (2021), and the table layout was improved.

Reviewer x4 : The glossary is helpful in defining key terms used throughout the report. The definitions are clear and easy to understand, without excessive jargon.

RESPONSE: Thank you!

Reviewer x5 : Coastal communities can be added to that section

RESPONSE: Thank you for the suggestion. Although 'coastal communities' was not added to the glossary, a explanatory footnote was inserted at the beginning of the Methods, when coastal communities first appear.

Reviewer x6 : Is consistency between EKLIPSE-reports desired? http://www.eklipse-mechanism.eu/apps/Eklipse_data/website/EKLIPSE_Report1-NBS_FINAL_Complete-08022017_LowRes_4Web.pdf

Particularly the definition of NbS that includes cost-effective, and co-benefits (page 3):

“Nature-Based Solutions (NBS) are solutions to societal challenges that are inspired and supported by nature, which are cost-effective, provide simultaneous environmental, social and economic benefits, and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions (European Commission, 2016)”. also Resilience reference in glossary

RESPONSE: Thank you for the observation. However, Eklipse reports are not necessarily consistent in terms of definitions employed, considering that terms like Nature-based solutions are constantly evolving in the literature and in the scientific debate. The same with resilience. We chose those definitions which we think were more in line with the requester's nature and needs.

Reviewer x7 : I suggest using the most recent reference on the NBS definition, provided at the dedicated section of this form.

Moreover, the manuscript often uses terms like nature-based actions, nature-based tools interchangeably with that of NBS. Given that these terms are not reported in the glossary, I recommend maintaining consistency in the use of NBS.

RESPONSE: Thanks for your suggestions. For the concept of NbS we used in the end the following: “El Harrak, M., & Lemaitre, F. (2023). European Roadmap to 2030 for Research and Innovation on Nature-based Solutions. NetworkNature” which is more updated. We tried to homogenise the use of the abbreviation NbS throughout the text, though it is common in the literature to find synonyms like the ones you mention, in addition to ecosystem-based or ecosystem-related approaches.

Reviewer x8 : Yes



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EMPOWERUS REQUEST

RESPONSE: Thank you!

Reviewer x9 : Some of the terms are hardly ever mentioned in the report, e.g. blue and circular economy. Consider removing. On the other hand, the term “empowerments” is frequently used in the report, apparently as a synonym of “empowerment tools”, but with not so clear meaning.

RESPONSE: Thanks for the suggestion. The definitions of circular and blue economy were removed. The term empowerments was removed from the document.

Reviewer x10 : Ok

RESPONSE: Thank you!

Reviewer x11 : I believe there could be a much better definition for the term “sustainability” from either physical sciences (e.g. Biology) or Humanities/Social Sciences (e.g., Political Ecology literature). Some examples: - Castro, C.J. (2004). Sustainable development: mainstream and critical perspectives. *Organisation and Environment*, 17(2), 195-225. - EU. (2016). Sustainable Development in the European Union. A statistical glance from the viewpoint of the sustainable development goals, Luxembourg: Publications Office of the European Union. - Jha, R., & Murthy, K.V. (2003). A critique of the Environmental Sustainability Index. <https://crawford.anu.edu.au/acde/publications/publish/papers/wp2003/wp-econ-2003-08.pdf> - Lele, S. (1991). “Sustainable development” a critical review. *World Development*, 19(6), 607-21. - UNCED. (1992). Earth Summit: Agenda 21. Programme for Action for Sustainable Development, N.Y., UN Public Information. Sustainable Development Knowledge Platform. <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>

RESPONSE: Thanks for the suggestions. We used an updated definition of sustainability to include the three E’s (environment, equity, and economics) found in “Brinkmann, R. (2023). *Defining Sustainability*. In R. Brinkmann (Ed.), *The Palgrave Handbook of Global Sustainability* (pp. 1-20). Palgrave Macmillan. https://doi.org/10.1007/978-3-031-01949-4_1”

Reviewer x12 : No comment

Reviewer x13 : No comment

Abbreviations

Reviewer x1 : no comment

Reviewer x2 : n/a

RESPONSE: Thank you!

Reviewer x3 : some lines show up



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EMPOWERUS REQUEST

RESPONSE: Thank you. This was fixed in the final version of the report.

Reviewer x4 : The list of abbreviations is useful for readers to reference the abbreviations used in the report.

RESPONSE: Thank you!

Reviewer x5 : It will be good to arrange the abbreviations alphabetically.

RESPONSE: Thanks for the remark. We made sure that the abbreviations followed an alphabetical order.

Reviewer x6 : no comment

Reviewer x7 : no comment

Reviewer x8 : Yes, but I am already familiar with many of these as I am part of the EmpowerUs project

RESPONSE: Thank you for your remark!

Reviewer x9 : no comment

Reviewer x10 : Ok

RESPONSE: Thank you!

Reviewer x11 : No change needed.

RESPONSE: Thanks!

Reviewer x12 : No comments

Reviewer x13 : No comments

2. Introduction

Reviewer x1 : 2.2 Knowledge need in the EmpowerUs project - “By facilitating approaches to multi-actor collaboration”: As above, we see empowerment as more than collaboration. Increased collaboration may not lead to empowerment.



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Figure 5. International Association for Public Participation (IAP2)'s public participation spectrum (Bobbio, 2019): I am not a fan of the definition here of 'Empower' - it is very narrow and excludes the public implementing actions themselves.

RESPONSE: Thanks for the remarks. Text in 2.2 was updated to: "by facilitating approaches to multi-actor collaboration and promoting community initiative". This way, we convey the message that empowerment goes beyond collaboration/participative processes. In regard to Figure 5 (now Fig. 4), we replaced the source of the figure and now it denotes initiative by the public. However, empowerment throughout the text should be interpreted according to the more comprehensive definition reported in the Glossary.

Reviewer x2 : Great

RESPONSE: Thank you

Reviewer x3 : ok

RESPONSE: Thank you

Reviewer x4 : The introduction provides a clear and concise overview of the context, background, and objectives of the report. The writing style is easy to follow and free of unnecessary jargon.

RESPONSE: Thank you

Reviewer x5 : no comment

Reviewer x6 : 2.1. very clear structure, but - Right in the first sentence, can you refer to or emphasise coastal communities or the sea-land interface (not only water) ? Or "coastal communities in particular" rather than all people - because that's the focus of this report. 2.2 I miss a note that the report doesn't directly address these TCLs but maybe it's because I'm aware of the original intention. (this information comes on page 17) Figure 3. Wrong caption? :)

RESPONSE: Thanks for the comment. The start of the Introduction was rewritten as suggested. Section 2.2 now provides a more in-depth explanation of the report being of value for TCLs but not necessarily providing specific recommendations for them as they can be extrapolated to other living labs and coastal areas in Europe. Caption of Fig. 3 was improved.

Reviewer x7 : [Section 2.2] The introduction does not clearly describe who was considered as requester. Based on the information provided in the Annex and the DoW, the requester was not limited to the EmpowerUS project coordination team but also included representatives from the project's Transition Coastal Labs representing the policy side. This information should be reported in the introduction to establish who will be the beneficiaries of the answering request process and, hence, what the targeted actors of the emerging recommendations are. The last paragraph of Box 1 is instrumental in understanding the role of Labs as requester. However, being within a box and not in the main text, readers might overlook it.



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EMPOWERUS REQUEST

[Section 2.3] Despite the EEA highlighting the policy relevance of the request, section 2.3 does not specify the conditions in which a research project could formulate a research question to Eklipse that might be within the project's scientific scope.

RESPONSE: *Thanks for the remarks. The last paragraph of 2.1 was improved to mention the different target audiences, including from the research and from the policy sides. The connections of the Introduction with Box 1 have been improved to make more explicit the role of TCLs as requesters. In regard to the last comment, although EmpowerUs is an Horizon research project, it includes non-research partners, and has different purposes than the one from the Expert Working Group of Eklipse, which is providing a synthesis of the best evidence about the role of NbS and ET in coastal resilience, while the EmpowerUs project has more specific objectives with direct applications in the TCL/Living Labs.*

Reviewer x8 : Yes

RESPONSE: *Thank you.*

Reviewer x9 : Page 11, third paragraph, consider adding a definition of the acronym ET “empowerment tools”. Page 12, second paragraph: maybe a more complete overview of the contents of the report could be useful. Moreover, make sure that the description matches the final contents, e.g. those in section 6.5 are defined “recommendations for research and policy”, not just for policy-making. Page 14, Box 1, third paragraph: this information is very important to understand the background of the request. Consider moving it to the main text (the Box might be seen as an additional content that could be skipped). Section 2.3 on the “Eklipse process” is a bit confusing. It is not clear whether the idea is to describe general features of the processes (as in the first paragraph about the scoping phase) or the specific process implemented in the case at hand. Moreover, the description covers only the first stages. We suggest providing a more complete description with a homogeneous level of detail for all the steps.

RESPONSE: *Thanks for the remarks. The comments about pg. 11 and 12 were handled as suggested. We did not exclude the last paragraph from the Box, but we improved the connections of the Introduction and 2.2. with Box 1. In regard to section 2.3, we extended the description of the Eklipse process and included the connections with Fig 2.*

Reviewer x10 : Ok

RESPONSE: *Thank you*

Reviewer x11 : I would take out the two first sentences “All people on Earth depend directly or indirectly on the oceans, seas and inland waters. Without healthy seas and waters, there is no life on Earth. This is why knowing, protecting and restoring our natural ecosystems is one of the defining endeavours of our time (UNESCO-IOC, 2022)”.

RESPONSE: *Thanks for the suggestion. The start of the Introduction was rewritten as suggested.*

Reviewer x12 : The introduction effectively sets the stage for the report and highlights the importance of the research question. I would like to suggest a few areas that may benefit from improvement:

- Adding a brief statement about the report's target audience (e.g., policymakers, coastal communities, researchers) to tailor the language and level of detail accordingly.



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If the target is a Broad Audience: "This report is intended for a broad audience interested in coastal resilience, including policymakers, coastal communities, researchers, and practitioners."

If the target is Policy Focus: "This report is aimed at policymakers and government agencies responsible for coastal management and development, providing insights into how community empowerment tools and nature-based solutions can build resilient coastal communities."

- Consider replacing "socio-economic empowerment" (page 1) with a simpler term like "empowering coastal communities" for broader audience understanding.

- While the benefits of NbS are mentioned, consider adding a specific example of an NbS in a coastal context (e.g., mangrove restoration for shoreline protection) to illustrate the concept further (page 1) for a broader audience.

RESPONSE: Thank you for your feedback. This response is divided in different sections to improve readability.

1. The last paragraph of 2.1 was improved to mention the diverse target audiences of the report, including from the research and from the policy sides.
2. Socio-economic empowerment is the name of the EmpowerUs project, so it cannot be changed.
3. Examples of NbS in the coastal context were added in the Introduction.

Reviewer x13 : No comment

3. Objectives

Reviewer x1 : no comment

Reviewer x2 : Clearly defined

RESPONSE: Thank you

Reviewer x3 : ok

RESPONSE: Thank you

Reviewer x4 : The objectives are clearly stated and align with the overall aim of the report.

RESPONSE: Thank you for your feedback!

Reviewer x5 : They are okay. However, it might be good to mention the reason for the focus on only Coastal communities across Europe and other high-income countries and territories. I suppose it is because it is an



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EmpowerUs1 project, funded under the European Union's Horizon Europe program. There could be other reasons which can be documented in the report and appreciated by readers.

RESPONSE: Thanks for the concern. Indeed, the focus on coastal areas was explained in more detail in the previous sections to make sure that the objectives outlined are clearly justified.

Reviewer x6 : Table of contents and chapter 3 Specific Objective 2 - "and develop a catalogue and classification scheme of ETs for this context." Can you mention, perhaps in 2.1 or here, why it's not necessary to develop a catalogue of NBS, too? I understand it isn't, because there's already more available on the NBS than ETs. You explain this in the conclusion on page 80.

RESPONSE: Thanks for the comment. The last paragraph of 2.1 emphasises the need for an ET catalogue and not for NBS, as there are already multiple ones.

Reviewer x7 : The report presents three objectives linked to three research questions. Nonetheless, I wonder how much the second and third questions overlap, considering that most retrieved papers relevant for the second research question concerned NBS contexts. In other words, what is the added value of the second research questions (i.e., empowerment tools for coastal resilience) if most of the results come from the literature that answered the third questions (NBS and empowerment tools for coastal resilience). This misunderstanding can be addressed by delineating specific sub-objectives for each research question, ultimately addressing the redundancies throughout the manuscript. For instance, Figure 4 reports two important questions, "How can NBS support empowerment?" and "How can empowerment support NBS processes?", that are not tackled in the discussion, conclusions and recommendations explicitly.

RESPONSE: Thanks for communicating your concern. Although most of the literature related to joint NbS+ET applications, objective 2 aimed at producing a list and classification of ETs, while objective 3 had a more critical approach evaluating empowerment outcomes. This is made more explicit in Table 1 and Figure 4 (now Fig. 5). The latter was improved to showcase all the sub-questions that were addressed during this process.

Reviewer x8 : Yes, and logical

RESPONSE: Thank you!

Reviewer x9 : In the formulation of the general objective (page 17) it is not quite clear what "these interventions" refer to: is it just NbS or also ET? In the formulation of the specific objectives (and later on in the report) the use of the term "volume" might be confusing. Perhaps use "amount" instead.

RESPONSE: Thank you. The text was improved as suggested.

Reviewer x10 : Ok

RESPONSE: Thank you

Reviewer x11 : No comment.

RESPONSE: Thank you



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Reviewer x12 : No comment.

Reviewer x13 : No comment

4.1. METHODOLOGICAL FRAMEWORK

Reviewer x1 : *no comment*

Reviewer x2 : Excellent

RESPONSE: Many thanks for your positive feedback.

Reviewer x3 : ok

RESPONSE: *Thank you.*

Reviewer x4 : The methodological framework (pages 13-14) is well-explained and easy to understand. The use of the figure (Figure 1, page 14) helps to visualise the framework.

RESPONSE: *Thank you for your feedback.*

Reviewer x5 : *no comment*

Reviewer x6 : *no comment*

Reviewer x7 : [Section 4.2.2] This section should detail, perhaps more exhaustively and straightforwardly, all the descriptors used to analyse the collected literature. This would facilitate the understandability of results.

RESPONSE: *many thanks for your comment. The EWG has taken your comment into consideration by making sure that the descriptors are well described in section "4.2.3.2. Data extraction and classification", but also by adding the search strings in "ANNEX 2a. Search string and relevant references of screened literature - Scientific literature" and "ANNEX 2b. Search string and relevant references of screened literature - Grey literature". Also some of the descriptors and their levels were explained in the Theoretical background sections (4.1.1.)*

Reviewer x8 : Yes. I dont have the references as I am writing the review, but I assume they are available.

RESPONSE: *Thank you for your comment. The references are all available "ANNEX 2a. Search string and relevant references of screened literature - Scientific literature" and "ANNEX 2b. Search string and relevant references of screened literature - Grey literature".*

Reviewer x9 : The title of section 4.1.2 is confusing: why is it called "initial"?



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RESPONSE: Thank you for your feedback, we have taken your comment into consideration and changed the title of section "4.1.2. Method selection procedure and contribution to objectives".

Reviewer x10 : Ok.

RESPONSE: Thank you.

Reviewer x11 : No comment.

Reviewer x12 : Suggesting areas for improvement:

- Consider replacing "Knowledge Synthesis Methods" (page 18) with a simpler term like "literature review methods" for a broader audience if this is the aim.
- Briefly explain the purpose of the MAGICKS toolbox (page 18) in a sentence or two or add a hyperlink to it.
- The description of the initial methodological framework (section 4.2.2 which I am guessing should be 4.1.2) could be shortened. The section can be condensed by focusing on the key takeaway: "In collaboration with Eklipse experts, a Rapid Evidence Assessment (REA) was chosen as the most effective and efficient methodology for this project. REA allows for a streamlined and focused review of the existing evidence on NbS, ETs, and their contributions to coastal resilience."
- The detailed breakdown of how the REA will address each objective in Table 1 is a helpful addition.

RESPONSE: Thank you for your detailed feedback. Some of your concerns were taken into consideration. The description of MAGICKS was added as a footnote. The sections 4.1.1 and 4.1.2 were merged and summarised into 4.1.2. Method selection procedure and contribution to objectives. However, the term "Knowledge Synthesis Methods" was kept as according to Eklipse website, they can comprise literature-based, people-based or decision-support methods.

Reviewer x13 : I am not a specialist in coastal issues, but I miss, within the analysis of the literature, a mention of the Coastal area management initiative, Coastal Area Management Programs (CAMPs), or other international programs

RESPONSE: Many thanks for pointing this out. As such, the report did not intend to focus on management initiatives but summarise the scientific state of the art. Yet, given the importance of management initiatives, we have made a reference to CAMPs in 2.3 section.

4.2. LITERATURE-BASED METHOD: RAPID EVIDENCE ASSESSMENT

Reviewer x1 : no comment

Reviewer x2 : Thorough



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RESPONSE: Thank you.

Reviewer x3 : ok

RESPONSE: Thanks.

Reviewer x4 : The description of the literature-based method (pages 14-15) is clear and provides sufficient details for the reader to understand the approach used in the evidence synthesis.

RESPONSE: many thanks for your feedback.

Reviewer x5 : no comment

Reviewer x6 : 4.2.3.1 Figure 5 is essential although from a previous reference - maybe use it later in 5.3.3 or 5.4.3 - or finally in 6.3.1?

RESPONSE: Thanks for the suggestion. Figure 5 (now Fig. 4) has now moved to a new Theoretical background (4.1.1) in which all concepts and descriptors are explained.

Reviewer x7 : [Section 4.2.3.1] The selected keywords in the categories of empowerment and resilience overlap. In terms of results, there is not much difference in using the query (“community empowerment” OR “empowerment”) or either using a query with only the term “empowerment”. In the category of NBS, perhaps the selected keywords are not comprehensive enough of NBS, considering that NBS synonymous are specific to societal challenges. For instance, for stormwater management, the most common terms are low impact development (LID) and sustainable urban development (SUD).

Perhaps I overlooked this part, but I didn’t find the eligibility criteria for the sample of papers.

RESPONSE: Thanks for the concern. We are aware that these keywords related to empowerment are overlapping, however we did not repeat the search because it wouldn’t have changed much the number of results that we obtained. In the case of NbS, we optimised the number of keywords related to this term to ensure that records remain relevant and manageable to analyse in the timeframe provided by the requester. If we had included more synonyms that number of records would have been too large to handle in time. Eligibility criteria can be found before 4.2.3.2

Reviewer x8 : yes

RESPONSE: Thank you.

Reviewer x9 : In section 4.2.1, second paragraph, it would be better to provide clear citations of the databases, e.g. World Bank Open Knowledge Repository, link to the webpage https://knowledge4policy.ec.europa.eu/text-mining/topic/tim_analytics_en for the TIM tool, Nature-based Solutions Knowledge Database of NetworkNature+. Moreover, PRISMA should be referred to as a “protocol” rather than a “technique”. In section 4.2.3.1 page 22 there seem to be some inconsistencies in the search string. For example, if you include the term “empowerment” as a keyword, it is useless to add “community empowerment”, “social empowerment”, and “empowerment tool”. Similarly for the terms associated with resilience. In section 4.2.3.1 page 23, from the description of the PICO descriptors it seems that (contrary to what is written in the text) comparator and outcome were not used as



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screening parameters for selection but only in a second stage to identify a subset of studies for further investigation. Please clarify this point. In section 4.2.3.6, among the main outcomes is mentioned “a list of challenges and opportunities to integrate these approaches for coastal resilience building in Europe”, but where is this list? If you refer here to the “recommendations”, then it would be better to call them in this way. There is also a list of challenges reported in page 69, but they only refer to NbS. The methods described in section 4.2.3.4 are suitable to provide a bibliometric and quantitative analysis of the selected publications, but they don’t explain how challenges and opportunities and/or recommendations can be drawn. Was there a specific way to highlight challenges and opportunities emerging from the literature?

RESPONSE: *Thanks for the remark. We are aware that the keywords related to empowerment and resilience are overlapping, however we did not repeat the search because it wouldn’t have changed much the number of results that we obtained. We included links to the grey literature databases in footnotes. PRISMA was referred to as protocol throughout the text. The PICO descriptors were clarified also, and we mentioned that the comparator and outcomes applied only for a selection of papers. In section 4.2.3.6 we changed the list of challenges for a list of recommendations.*

Reviewer x10 : Ok

RESPONSE: *Thanks.*

Reviewer x11 : No comment.

RESPONSE: *Thank you.*

Reviewer x12 :- *For a broader audience, consider replacing technical terms like "prevalences" or "bibliometric analyses" with simpler explanations if possible (e.g., "percentage of studies reporting a specific characteristic").*

- This section is quite detailed. It would be good if we considered summarising some aspects. For instance, you can mention the concept of "categories a posteriori" without going into extensive detail.

RESPONSE: *Thanks for your comment. The referred terms were explained further to improve the readability of the text as advised.*

Reviewer x13 : *I’ve learned a lot about these methodologies!!!*

RESPONSE: *Thanks.*

5.1. Literature volumes and characteristics

Reviewer x1 : *no comment*

Reviewer x2 : Great



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RESPONSE: Thank you.

Reviewer x3 : ok

RESPONSE: many thanks.

Reviewer x4 : This section (pages 15-16) is well-written and provides a clear overview of the literature volumes and characteristics. The use of Table 1 (page 16) is helpful at summarising the different types of nature-based solutions.

RESPONSE: Thank you very much for your feedback.

Reviewer x5 : no comment

Reviewer x6 : In 5.1.5 the text “Notably, restoration, depicted prominently in the upper left corner of the cloud (Figure 10), occupies a significant space within the word cloud.” is not logical. Many other words in Figure 10 occupy similar space. Is there another reason to point the term out?

RESPONSE: Thanks for your remark. Please notice that the word cloud was removed from the report.

Reviewer x7 : [Section 5.1.5] I wonder about the added value of the word cloud analysis’s results of Figure 10. It does not add anything relevant to the research questions. Rather, the results are the consequences of the methodological setting and the selected keywords for the search queries.

[Section 5.1.6] The “coastal” ecosystem category can bring some confusion. It is a bit redundant to have coastal as a subcategory for clustering results, considering that it was already considered within the search query. Hence, the eligible sample of retrieved papers is expected to concern coastal areas. Perhaps coastal ecosystems should be included in the glossary to avoid misinterpretations. In my view, coastal areas (the scope of the report) can be characterised by urban, cropland, wetlands and other ecosystem types. In this sense, what is the difference between the category of coastal ecosystems and that of marine ecosystems?

RESPONSE: Thanks for raising this point. Word clouds were removed from the document as suggested by other reviewers. In regard to section 5.1.6 (now 5.1.5), we are aware that our records were biased towards coastal and marine ecosystems as these keywords were included in searches, but as many studies occurred in multiple ecosystems, it was interesting to know which combinations occurred most frequently (e.g., coastal + marine, coastal + urban, coastal + wetland, etc.) to recognize which types of NbS approaches and challenges were addressed.

Reviewer x8 : Good

RESPONSE: Thank you.

Reviewer x9 : In section 5.1.2 you mention 41 “studies addressing NbSs and empowerments”. It should be clarified that these studies address either NbS or empowerment or both. Moreover, the term “empowerments” is not clear. In section 5.1.5 there are references to temporal processes (trends, enduring, ...) which can not be captured by a world cloud analysis.



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RESPONSE: Thanks for your remark. Please check the revised version of the report, where this was changed to “either NbS or ET or both”. The term *empowerments* was removed throughout the report. Word clouds were removed from the document as suggested by other reviewers.

Reviewer x10 : Ok

RESPONSE: Thanks.

Reviewer x11 : There is no info about the journals where the selected papers were published. It is crucial in order to evaluate the variety of fields of science and/or topics.

RESPONSE: Thanks for your concern. *It is not the purpose of the report (nor is it advisable when applying the PRISMA protocol) to identify the journals consulted. We don't think this information would add much to the discussion of the results, since studies were already classified in relation to their focus (ecological vs. social), which is usually reflected in the nature of the journal.*

Reviewer x12: This section effectively summarises the retrieved literature using the REA methodology. The detailed breakdown and clear explanations enhance the reader's understanding of the included studies. Specifically, the explanations for the increasing trend in publications (pg 28) and the decline in 2023 (pg 28) are well-presented. Moreover, the inclusion of figures like the PRISMA flow diagram (Figure 6) and charts depicting publication trends (Figure 7), topic distribution (Figure 9), and ecosystem types (Figure 11) effectively complements the text. Yet, here are 2 tiny suggestions for improvement:

- Mentioning a few specific keywords from the word cloud analysis (5.1.5) and specific ecosystem types (e.g., mangroves) within coastal ecosystems (5.1.6) could add clarity.
- Briefly acknowledge limitations of the search strategy, such as language restrictions or specific database choices.

RESPONSE: Thanks for this remark. REA limitations are now better highlighted in section 5.1.1 and 6.1.1, including the geographical bias of our results. Also, we have decided to remove the word cloud from the final report as suggested by other reviewers.

Reviewer x13: In general terms, my main suggestion would be that the text may include more examples (in the form of a "box") to enrich the lessons learned; therefore the numerical analysis showed in the report would be enriched with practical examples that could be a source of inspiration for the readers

RESPONSE: Thank you in advance for your suggestion. The placement of boxes was carefully defined based on the need to emphasise key aspects of the report (i.e., provide focus on key definitions or examples). As such, we included one more box about the different NbS approaches in the new Theoretical background section (4.1.1), and erased the one about Sustainable land-use planning. Placing more boxes would lengthen the document (which is already too long) and detract from their added value. However, many examples were added in Results sections in general, to enrich the points made and lessons learnt.



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5.2 Definitions of Resilience

Reviewer x1 : According to our research, the definition of “resilience” ...: This is interesting. Is there a temporal aspect to this? Resilience was a very popular concept but then became a contested term - especially when viewed through a social science lens. There were also some debates about resilience as a normative ideal and as an analytical concept.

RESPONSE: Thanks for your concern. We have added some sentences mentioning from which years were the publications defining resilience and whether there was a temporal trend or not.

Reviewer x2 : Keep stand, and easily able to recover.

RESPONSE: Thank you for your feedback.

Reviewer x3 : ok

RESPONSE: Thank you.

Reviewer x4 : The definitions of resilience (pages 16-17) are clearly explained and supported by relevant references.

RESPONSE: Thank you for your feedback.

Reviewer x5 : no comment

Reviewer x6 : Figure 16 is not necessary. Could you mention that resilience is usually considered positive and desired but resilience of for example communities can also hinder sustainable change? I’m missing the perfect reference to exemplify here, but for example Wu and Wu 2013:224 in <https://link.springer.com/book/10.1007/978-94-007-5341-9> also Meerow et al. 2016 <https://www.sciencedirect.com/science/article/abs/pii/S0169204615002418> Cumming et al. 2005 DOI: 10.1007/s10021-005-0129-z

RESPONSE: Many thanks for your interesting input. We have decided to remove the word clouds from the final report as suggested by other reviewers. Meerow et al. 2016 is already part of the literature for our REA. It was also added to this section that resilience is usually considered positive, but can also hinder sustainable change.

Reviewer x7 : no comment

Reviewer x8 : Good

RESPONSE: Thank you.

Reviewer x9 : The role of this section in the overall context of the request should be better clarified. As it is now, it has no apparent relationship with what comes next.

RESPONSE: many thanks for your feedback, we have reworked the text to better link the sections between them.



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Reviewer x10 : Ok

RESPONSE: *Thank you.*

Reviewer x11 : I am not sure if Fig. 16 and its explanation is really needed. It does not add any further knowledge to the report as it is not analysed adequately.

RESPONSE: *Many thanks for your feedback. We have removed the figure mentioned above.*

Reviewer x12 : Suggestions for improvement:

- The section focuses on definitions but doesn't explicitly connect them to the broader themes of NbS and Empowerment. How do these understandings of resilience influence the application of NbS or the role of empowerment in building coastal resilience?

Adding a short discussion on how the identified definitions of resilience (both socio-ecological and potentially contrasting ones) connect to the overall themes of NbS and Empowerment within coastal communities and how these varying understandings might influence the selection of NbS interventions, the role of empowerment in building resilience, or the expected outcomes of such strategies.

- While the socio-ecological perspective is given detailed attention, it's equally important to explore the remaining 34% of studies that define resilience differently. This exploration will help us understand the full spectrum of how resilience is conceptualized in this research area, thereby enriching our understanding of the topic.

- The limited number of studies defining resilience (11%) is intriguing, but the report doesn't delve into potential reasons. It would be interesting to know if there were specific methodological choices or implicit assumptions within the field that might explain this finding.

RESPONSE: *Many thanks for your feedback. We have improved the connections of social-ecological resilience with the broader themes of NbS and empowerment in this section. Also these connections were discussed in section 6.4.2 and Figure 30. Indeed the number of papers defining resilience is small, and in those that the word is mentioned, it is usually used as a buzzword without providing a clear definition or evidence of whether it was achieved or not, or even the methods to measure it. We provide some discussion of this in 6.4.2.*

Annex 3 provides a list of all the definitions of resilience found in publications, including the 'only' ecological and 'only' social definitions.

It is true that the social-ecological perspective is given our detailed attention in this Rapid-evidence assessment. And this is due to the fact that we are addressing specifically the resilience of coastal communities. For that reason we did not focus our analysis in the studies defining resilience only in ecological or in social terms. Our interest was to know how social-ecological resilience functions in order to define how NbS and ET can contribute to this integrated goal in the framework of coastal societies. In any case, in page 81 we analyse how social and ecological resilience can be also in conflict in cases of top-down conservation governance approaches that neglect social justice aspects.

As per the limited number of studies defining "Resilience", as described in the Methodology, a Rapid Evidence Assessment (REA) is a form of literature review that describes the volume and characteristics of an evidence base,



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provides a synthesis of what that evidence indicates and critically assess such evidence. REAs are not as exhaustive and comprehensive as a full systematic review, and therefore they make concessions in relation to the breadth, depth and comprehensiveness of the search. In this framework, our focus was made on analysing the results we obtained regarding the definitions of “Resilience” found in the literature, without specifically interpreting why there is such a reduced number of studies defining it. Also, the fact that our query included an extense number of keywords ((NbS OR empowerment tools) AND resilience AND coastal) has logically had an influence in our results. Finally, as we pointed out in the section addressing the Definitions of Resilience, some papers recognize indeed the ambiguity of the resilience concept itself, “with multiple, potentially incommensurable definitions having been advanced in scholarship and policy” (Bone et al., 2016).

5.3. (Objective 1) Nexus between NbSs and coastal challenges and resilience

Reviewer x1 : 5.3.1. Nature-based Solution approaches: I think it would be useful to distinguish between papers that are reporting on research projects and papers that are reporting on more long-term governance initiatives.

5.3.2. Societal challenges addressed by NbSs - “For instance, Pinkerton et al (2019) argue that an EbM approach can contribute to increasing social justice by empowering indigenous communities through more effective fisheries management. Spalding et al (2014) find that EbA approaches (such as wetland restoration) can protect vulnerable communities from increasing coastal climate risks.” : It would be good to go beyond stating what they argue and illustrate whether they evidence these claims or not. Not just for these papers, but for all claims repeated in this document. I think this is important if the report is to be used as an ‘evidenced-based’ review.

5.3.3. Level of stakeholder engagement achieved by NbSs and direction of governance process - “on the directional governance mechanisms at place”: But wouldn’t some paper have been derived from research projects and may have been disconnected from governance mechanisms.

- Ramalho et al. (2022) studied the relevance of NbSs in local climate adaptation strategies by surveying all municipalities across Portugal, and found evidence that NbSs are increasingly implemented through top-down approaches. Conversely, Mollmann et al. (2014) adopted a bottom-up approach in their study, in which expert knowledge was leveraged and stakeholders participated in the design of ecosystem-based fisheries management strategies, aiming to transition from single-species to integrated ecosystem assessments, ultimately providing valuable advice for managing Baltic Sea fish stocks.: Can you provide any evidence of the impact of either approach? What did these studies find and were they robust studies?

Figure 21. Stages of the project cycle addressed by NbS reviewed studies (N=199): Again, the issue of research projects versus government projects might explain why there are a lot of NbS projects reported as design and planning phases but not many in the implementation phase.



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RESPONSE: Thanks for your remark. Unfortunately, we did not distinguish between research and governance papers, but we discussed this limitation in 6.2. (challenge No. 2) as it can influence the direction of the governance process and project cycle stage addressed by the papers. About the contribution of the studies: Ramalho et al. (2022), indicates that community-based adaptation is a concept that many municipalities may either be unaware of or undervalue, whereas Mollmann et al., (2014) combine both tactical and strategic management aspects into a single strategy that supports the present Baltic Sea fish stock advice. The latter is now included in the text.

Reviewer x2 : no comment

Reviewer x3 : ok

RESPONSE: Thank you.

Reviewer x4 : This section (pages 17-24) is well-structured and easy to follow. The use of subheadings and bullet points helps to organise the information effectively. The writing style is clear and free of unnecessary jargon.

RESPONSE: Thank you for your feedback.

Reviewer x5 : no comment

Reviewer x6 : 5.3.1 Figure 17 B - “other categories” needs a little more clarity in the caption, included by who, from where? The explanatory text on page 36 is not very legible due to many brackets. Double-check referencing the figure, is there punctuation missing? The categories “planning”, “infrastructure” are well defined in text but in Fig. 17 B makes one think that it could include grey infrastructure and all kinds of planning. Can you develop the names of the categories f.e. green infrastructure; ecological planning/policy.

Page 43 nice results and nice to read, great that you found a way to extract this from the REA

RESPONSE: Thanks for your remark. The text (and figure caption) was reformulated to improve clarity on this subject.

Reviewer x7 : no comment

Reviewer x8 : Good and relevant

RESPONSE: Thank you.

Reviewer x9 : In section 5.3.1 it is not clear what is meant with “climate adaptation services” in the context of NbS approaches. Box 2 is wrongly numbered as “Box 3” and it is never referenced in the text. it is difficult to understand the reason why it was included. Section 5.3.5 seems to overlap with the topic of 5.3.2 but provides more details. Perhaps the two sections should be merged. In section 5.3.6 the different categories of resilience seem not well-grounded in the existing literature and largely overlapping. Moreover, they are never mentioned again in the report. What is the purpose of identifying them only in relation to NbS?

RESPONSE: Thanks for your remark. Box 2 was considered unnecessary and was therefore replaced with a description and classification of the different NbS approaches, including climate adaptation services. The different NbS approaches and other concepts of the report were explained in a new section of Theoretical background (4.1.1). Also, we would like to maintain both sections 5.3.5 and 5.3.2 without merging, as the latter refers to specific challenges



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found in European coastlines, including the TCL, while the former relates to general global societal challenges delimited by the IUCN. Indeed the categories described in section 5.3.6 were not discussed and thus they were removed from the report.

Reviewer x10 : Ok

RESPONSE: *Thank you.*

Reviewer x11 : Fig. 21 is really crucial and the core of the section and should be explained a bit further.

RESPONSE: *Thanks for the concern. Although we do not add more details here to keep results concise, this result is discussed in 6.2, as it's quite relevant.*

Reviewer x12 : Suggestions for improvement:

- The potential connection between NbS and empowerment (a key theme of the research) should be explicitly discussed in this section. Exploring how empowerment approaches influence NbS design, implementation, or outcomes could strengthen the analysis.
- Maybe including specific case studies that exemplify successful NbS interventions with high stakeholder engagement or effective contributions to resilience could enrich the section.
- To enhance the quality of the section, it would be useful to delve deeper into the strengths and limitations of each NbS approach in varied contexts. This will provide readers with a more comprehensive understanding of the effectiveness of these approaches, thereby helping them make informed decisions.
- I think this section should conclude by highlighting potential areas for future research on NbS, stakeholder engagement, governance processes, and their combined impact on coastal resilience.

RESPONSE: *Thanks for your comments. We did not explore the connections between NbS and ET (and empowerment in general) in this section but in section 5.5. Some successful case studies about NbS projects addressing high engagement levels were reported in section 5.3.3, and throughout the discussion. In regard to the pros and cons of the different NbS approaches, it was not the purpose of the report to fully explain the differences of these usually overlapping approaches (although see Box 2 for definitions), but to highlight that these approaches when combined with ET become more effective in fostering empowerment and resilience. This is discussed in section 6.4.1.*

Reviewer x13 : *no comment*

5.4 (Objective 2) Nexus between ETs and coastal challenges and resilience

Reviewer x1 : Figure 23. Relative contribution of empowerment studies (N=151) focusing on coastal challenges relevant to coastal communities in Europe categorised by domain : The figure is a little hard to decipher.



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RESPONSE: Thanks for your comment. The final version of this report has improved the resolution and design of all figures, including this one.

Reviewer x2 : no comment

Reviewer x3 : Ok

RESPONSE: Thank you.

Reviewer x4 : The section on empowerment tools (pages 24-29) is generally well-written and easy to understand. However, some parts could benefit from additional clarity or examples to better explain certain concepts or terms. For instance, the discussion on “Empowerment Outcomes” (page 28) could be expanded with more specific examples to aid understanding.

RESPONSE: Many thanks for your input. Unfortunately, the empowerment outcomes section hasn't been improved with more examples; the reason why is that the section is based on the literature review and there were very limited outcomes reported.

Reviewer x5 : no comment

Reviewer x6 : 5.4.3. Super interesting! Congratulations. (I'm not expert enough to review this part critically). The 6th category nature-based relates with the request and the reviewed literature, but it stands out a bit since the other categories are not thematic like there could be community-led financial or health tools etc. Consider if you need to justify this.

RESPONSE: Many thanks for your positive feedback.

Reviewer x7 : [Section 5.4.2] It is important to anticipate the meaning of the different categories represented in Figure 24 as part of the method section, and in the results, provide some representative examples for the different actions-based categories to reinforce the empirical grounding of the outcomes/recommendations. This approach can hold for the rest of the results.

[Section 5.4.3] I suggest reconsidering social learning, polycentric governance, and co-creation approaches as strict “tools”. Perhaps the compilation of empowerment tools could also include frameworks and processes.

RESPONSE: Thanks for your comments. In regard to section 5.4.2, the scopes of action are already explained in the Methods section (footnote in 4.2.3.2), and we have included some examples in the final report. In addition, it is mentioned here and throughout the document (e.g. Table 4) that empowerment tools also encompass frameworks and approaches.

Reviewer x8 : Good and relevant. Fig 22 and 23: is it possible to make the text visible in all boxes somehow/somewhere. The Blue Growth is a central challenge according to preliminary findings in EmpowerUs.

RESPONSE: Many thanks for your feedback. We will improve the quality of the figures in the last version of the report.

Reviewer x9 : In Table 3, only ET categories are considered but not the detailed actions mentioned in the text. Moreover, it is not clear how the list has been compiled: why are there rows with no sources? Did you still find them



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in the literature review? In Table 3, what do you mean with “nature-based food production”? The term is very confusing.

RESPONSE: Thanks for your comments. The actions are explained in the text above rather than the table. These actions are usually non-mutually exclusive, so a particular method within a category can contribute to multiple actions. All rows in Table 3 have been given a reference, either from our REA literature list, or other sources (like dictionaries). The term “nature-based production” is used in the NbS literature, and we think that the concept provided is clear enough to distinguish it from other food production approaches, like organic agriculture, agroforestry, etc.

Reviewer x10 : Ok

RESPONSE: Thank you.

Reviewer x11 : As above, Fig. 23 is really crucial and the core of the section and should be explained a bit further.

RESPONSE: Thanks for your comment. Although we do not add more details here to keep results concise, this result is discussed enough in the corresponding section.

Reviewer x12 : This section has the potential to make a significant contribution to the field of coastal resilience. In particular, the review of the Empowerment Tools table is insightful and thorough.

A few suggestions for consideration:

- While the section introduces the ET classification, a deeper discussion of each tool type with concrete examples would be beneficial. This would provide a clearer understanding of how these tools translate into real-world applications.

Maybe referencing a framework for evaluating the effectiveness of empowerment initiatives, including metrics like:

- Increased community participation
 - Enhanced knowledge and skills related to coastal challenges
 - Improved sense of ownership and agency within the community
 - Long-term sustainability of solutions
- Perhaps add a brief section discussing potential challenges associated with co-creation, such as:
- Balancing technical expertise with local knowledge
 - Ensuring equitable participation from diverse stakeholders
 - Navigating power dynamics within communities
 - Building consensus and managing conflicting priorities



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- Highlight the importance of tailoring co-creation approaches to the specific cultural context of each coastal community.

- I'm unsure if it fits, but mentioning how empowerment initiatives can address gender inequalities within coastal communities could be beneficial. Women often play a crucial role in coastal resource management, and their voices need to be amplified.

RESPONSE: *Thanks for your remarks. We have included examples of the different tools and methods under distinct categories in the text above Table 3. We highlighted in section 5.5 the lack of frameworks and methodologies to evaluate empowerment outcomes, and provide recommendations to tackle that. The challenges of co-creation, although not mentioned in a particular section, I think are common to the challenges of NbS and other empowerment tools, and have been discussed throughout that section. This includes the risk of NbS or other ET in exacerbating inequalities. Although gender inequalities have not been mentioned explicitly in this section, we discussed the risk associated with NbS and ET in producing inequalities in vulnerable and marginalised groups, which often include women in 6.2.*

Reviewer x13: no comment

5.5 (Objective 3) Links between NbSs and ETs and empowerment outcomes

Reviewer x1 : *no comment*

Reviewer x2 : *no comment*

Reviewer x3 : OK

RESPONSE: *Thank you.*

Reviewer x4 : This section (pages 29-42) provides a comprehensive overview of the links between nature-based solutions, empowerment tools, and empowerment outcomes. The use of case studies (Section 4, pages 30-42) helps to illustrate the concepts with real-world examples, which is helpful for the reader.

RESPONSE: *Thank you for your positive feedback.*

Reviewer x5 : *no comment*

Reviewer x6 : 5.5.1 Maybe it's my ignorance, but I find this objective and the results difficult to understand. Maybe it's the phrase "Empowerment literature scopes of actions" Figure 26 and 27 help but please provide a header for "Empowerment literature scope of action" Page 61 why studies with "co-creation approaches" are explained in



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particular? I find this confusing as previously I read about “Co-creation tools” (table 3 / classification of ETs) and in the caption of figure 27 “co-creation perspectives” are these the same?

RESPONSE: *Thanks. The reviewer is right; the previous choice of terms was not the most favourable, so this expression has now been clarified in the corrected version. By making specific reference to studies detailing aspects of co-creation, we wanted to emphasise the lack of data on this type of approach, so we simplified the results in this section. The caption of figure 27 was also corrected. Although co-creation tools, like Living Labs, are a category of ET, it is also a term that is extensively used in the NbS and empowerment literature, so we specifically searched the connections of these NbS+ET case studies with co-creation perspectives/approaches employed during the project cycle.*

5.5.3. I find many examples of empowerment methods, approaches or mechanisms but I miss a list of examples of empowerment outcomes that the subtitle suggests. A careful reader finds some, but can you elaborate “diverse outcomes” “to realise empowerment outcomes” (such as...) - or change the subtitle? On 6.3.1. this is also explained: “empowerment can be understood as both a process and an outcome”

RESPONSE: *Thanks for the comment. The subtitle was changed to improve the understanding of the purpose of this subsection, as indeed hardly any empowerment outcome was reported in the reviewed literature, but only few papers included methods/indicators to measure empowerment.*

Reviewer x7 : no comment

Reviewer x8 : Good and relevant

RESPONSE: *Thank you.*

Reviewer x9 : Section 5.5.3, first line, the number of publications was 24 in the previous section. Box 5: it is not clear how the exemplary indicators for community wellbeing combine with the wheel.

RESPONSE: *Thanks for the concern. Indeed, the number of NbS+ET papers addressing empowerment level was 24, but there were 2 papers relating only to ET that addressed empowerment, adding to 26. From this, we analysed a subset of 21 papers for empowerment outcomes and their methods.*

Reviewer x10 : Ok

RESPONSE: *Thank you.*

Reviewer x11 : Fig. in page 66 is not explained at all (and caption is missing). I don't see its usefulness.

RESPONSE: *Thanks for the remark. A table number (B5.1) and caption was added in the final version of the report.*

Reviewer x12 : Suggestions for improvement:

- The analysis of this part of the result provides valuable findings, however it could benefit from including some discussion on the challenges associated with integrating NbSs, empowerment strategies, and co-creation approaches in real-world applications. This could involve complexities such as:



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- Balancing technical expertise with local knowledge
 - Ensuring equitable participation from diverse stakeholders
 - Navigating power dynamics within communities
 - Building consensus and managing conflicting priorities
 - Long-term funding and resource constraints
- To sum up the result section, it can be mentioned how the empowerment achieved through these approaches translates into long-term sustainability efforts in coastal communities. This could involve analyzing how empowered communities are better equipped to manage resources, make informed decisions, and adapt to future challenges.
- It's important to underline the potential for scaling up successful NbS + empowerment initiatives and replicating them across different coastal contexts. Factors that may influence scalability (e.g., institutional support, funding mechanisms) and potential challenges associated with applying these approaches in diverse settings should be discussed, fostering a sense of optimism about future possibilities.
- The results section highlights co-creation as key to empowering coastal communities. To make it more useful for practitioners, we can explore the specific methods used:
- Participatory Action Research involves researchers and community members working together throughout the project (identifying issues, designing solutions, etc.).
 - Social Learning Frameworks: Create spaces for scientists and community members to learn from each other, sharing knowledge about ecosystems and local experiences.
 - Co-production Tools: Techniques like mapping workshops, storytelling sessions, and participatory modeling help create knowledge together.
 - Addressing Power Imbalances: Strategies like identifying power dynamics, creating inclusive participation structures, and building community capacity ensure everyone has a voice.

RESPONSE: *Thanks for your comments. Although in this section we provided results related to NbS+ET integration, a more detailed discussion of the challenges associated with this integration can be found in 6.4 and other parts of the Discussion, including addressing power imbalances. We also provided a recommendation about implementing solutions that are scalable/replicable in other regions of Europe/countries, and we acknowledged the need for long-term funding. Tools like Social Learning, and Participatory Action Research (synonym with Community-based Participatory Research in our catalogue) are explained in the text with examples and in Table 3.*

Reviewer x13: *no comment*



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6.1. General introduction/findings

Reviewer x1 : *no comment*

Reviewer x2 : Nicely drafted.

RESPONSE: *Thank you.*

Reviewer x3 : *no comment*

Reviewer x4 : The general introduction and findings (pages 43-44) provide a clear and concise summary of the main results and findings of the report.

RESPONSE: *Thank you for your feedback*

Reviewer x5 : *no comment*

Reviewer x6 : *no comment*

Reviewer x7 : Please see the comment reported in the first question of this form.

RESPONSE: *Thank you, we took into account some of the comments made there.*

Reviewer x8 : good.

RESPONSE: *Thanks.*

Reviewer x9 : The general introduction should begin with a summary of the number of publications used to respond to the three specific questions. Section 6.1.1 could be merged under the general title of 6.1.

RESPONSE: *Thanks for your remarks, more on the number of reviewed publications was added to section 6.1. We did however keep subsection 6.1 to discuss how diverse our dataset was, and we expanded that section.*

Reviewer x10 : Ok

RESPONSE: *Thank you.*

Reviewer x11 : No further comment.

Reviewer x12: *no comment*

Reviewer x13: As I have mentioned, it would be interesting to place more emphasis and give differentiated treatment to the "gray-literature" (guidelines, and so on) because the objective and approaches of this kind of documents are quite different from the scientific studies

RESPONSE: *Thanks for your comment. We have acknowledged the differences in scope between the scientific and grey literature throughout the report. For instance, in section 5.3.3 we mentioned that scientific publications did not report methods for measuring empowerment, while two grey-literature publications offer approaches to*



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measuring empowerment outcomes, even though we found less relevant grey-literature documents overall. We also discussed the bias of studies having a research vs governance/practice focus (usually grey literature) in 6.2., as this could have had an influence on the differences in direction of the governance process and project cycle stage addressed by the papers. Yet, the limited number of studies obtained through the literature search is a finding itself. Hence there is a need for future research on this matter, comprising in depth studies on the ways and approaches to measure empowerment in grey literature - this has been added to the recommendations.

6.2. Specific Objective 1: Rapidly review and summarise the volumes, characteristics and contributions of the existing evidence on the application of NbSs for coastal resilience building in Europe and other high-income countries and territories.

Reviewer x1 : no comment

Reviewer x2 : I think this should also address the diverse populations, and communities of the poor European coastal areas, which are suffering due to automation.

RESPONSE: Thanks for the comment. Although that's *not the focus of our work*, we have considered diversity in populations, mentioning that the implementation of NbS may not always offer a win-win solution if it fails to adequately benefit local communities and marginalised or vulnerable groups, such as women and immigrants. These inequalities are more evident in some EU regions and countries than others.

Reviewer x3 : ok

RESPONSE: Thank you.

Reviewer x4 : This section (pages 44-46) is well-written and effectively summarises the key findings related to Objective 1. The use of subheadings and bullet points helps to organise the information clearly.

RESPONSE: Thank you for your positive feedback.

Reviewer x5 : no comment

Reviewer x6 : no comment

Reviewer x7 : Please see the comment reported in the first question of this form.

RESPONSE: Thank you, we took into consideration some of the comments provided there.

Reviewer x8 : Ok

RESPONSE: Thanks.

Reviewer x9 : Page 69: it must be clear that your findings are not for the whole literature on NbS but specific only for cases in coastal areas. Page 69, intro to the list: are the challenges based on the literature? How were they



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identified? Some points seem reasonable but not found in the results of the review. Moreover, is the NbS framework the focus of the discussion or rather NbS applications? Page 69 point 2: based on your results there are several studies focusing on evaluation. Why do you claim the opposite here?

The role of Figure 30 and its origin is unclear. Why do you include these recommendations on NbS? How did you define the categories (which are the same as Figure 31)? In which way are these linked to your findings and to the publications that you analysed?

RESPONSE: *Thank you for your input, we have now improved the connections with European coastal areas in this specific part and we mentioned how we identified these challenges through content analysis and grouping. Although the evaluation phase is more represented than the implementation phase, we wanted to highlight the predominance of studies at the initial planning stages, probably due to many articles having a pure research focus. In regard to the recommendations in Fig. 30 and 31 (now Fig. 27 and 28), these four pillars were proposed by the EWG, based on the gaps identified in the reviewed literature. We included a sentence mentioning how we identified such pillars in the text above both figures.*

Reviewer x10 : Other solutions like engineering solutions should be presented here as well as advantages of NbS to them.

RESPONSE: *Thanks for the suggestion. We have included some knowledge about grey- or hard-engineering solutions in Europe in our introduction and discussion sections. However, it was not our focus and therefore we have not compared it with NBS as much, as our goal was to study how NBS and ET contribute to resilience.*

Reviewer x11 : No further comment.

Reviewer x12: no comment

Reviewer x13: no comment

6.3. Specific Objective 2: Rapidly review and summarise the volumes, characteristics and contributions of the existing evidence on the application of ETs for coastal resilience building in Europe and other high-income countries and territories, and develop a catalogue and classification scheme of ETs for this context.

Reviewer x1 : no comment

Reviewer x2 : Reviewed, thorough



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RESPONSE: Thank you.

Reviewer x3 : ok

RESPONSE: Thanks.

Reviewer x4 : The discussion on Objective 2 (pages 46-50) is generally clear and easy to follow. However, some parts could benefit from additional clarity or examples to better explain certain concepts or terms related to empowerment tools.

RESPONSE: Thanks for your comment. We have improved the clarity of the text in this section and other sections of the Discussion, providing examples and explaining terms when possible. In addition, clarity should be enhanced through introduction of a new chapter on conceptual backgrounds, giving background information and conceptual guidance.

Reviewer x5 : no comment

Reviewer x6 : A reflection arises at this point: Are we assuming that coastal communities are weak or lacking power, and need empowering? Although it's in the definition: "...Through this process, individuals lacking an equitable share of valued resources gain greater access, decision authority, and power over their lives." - should the discussion briefly elaborate on who needs empowering in relation to who/what system? Perhaps linked to this: "it is crucial to carefully consider the trade-offs between environmental sustainability and social justice when implementing NbSs." (discussion on page 76)

6.3.1 Be proud your finding! That the EWG defined/developed/provided these ET categories (instead of "the analysis revealed")

RESPONSE: Thanks for the comments. We improved the text by omitting phrasing like "the analysis revealed". Also, although not discussed in this section, in section 6.4.1 and other parts of the discussion, we provide links to social justice mentioning that NbS and ET initiatives should try to overcome power inequalities in communities, especially in regard to marginalised and vulnerable groups, but without meaning that all communities are weak and/or need empowerment. Furthermore, empowerment and democratization regarding planning and enhancing urban spaces is a precondition for resilient societies.

Reviewer x7 : Please see the comment reported in the first question of this form.

RESPONSE: Thank you, we have considered some of those comments in our final report.

Reviewer x8 : ok

RESPONSE: Thanks.

Reviewer x9 : Table 4 is just a repetition of the results. Consider moving it to the conclusions instead. Page 73, first paragraph: do you mean the level of empowerment or the level of engagement/participation here? As for Figure 30, the role of Figure 30 and its origin is unclear. Why do you include these recommendations on ETs? How did you define the categories? In which way are these linked to your findings and to the publications that you analysed?



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RESPONSE: Although Table 3 and Table 4 are very related, the former is more comprehensive and provides examples of methods and a classification scheme of empowerment tools, frameworks and approaches. Explanation of each category and actions within each category are provided in the text above. Table 4 is in the Discussion and provides a summary of ET categories as a take-home message. Therefore, we think we should keep both tables in the final result. We have also changed the term "level of empowerment" to "level of engagement/participation". In regard to the recommendations in Fig. 30 and 31 (now Fig. 27 and 28), these four pillars were proposed by the EWG, based on the gaps identified in the reviewed literature. We included a sentence mentioning how we identified such pillars in the text above both figures.

Reviewer x10 : Ok

RESPONSE: Thanks.

Reviewer x11 : No further comment.

Reviewer x12: no comment

Reviewer x13: no comment

6.4. Specific Objective 3: Synthesise the scope and characteristics of the joint application of NbSs and ETs for coastal resilience building in Europe and other high-income countries and territories, and critically assess the outcomes/impacts of such interventions in fostering empowerment.

Reviewer x1 : no comment

Reviewer x2 : Maybe add critic as well rather than just what the research is stating, like on Page 49, knowledge tools are mentioned but it would be good to give insights, and say about having discussions within the faith based knowledge communities, through book clubs or other ventures to enable the cognition, and questioning endeavours to take place, whereby the local economies can be supported, and create more green thumbs progress grows.

RESPONSE: Thanks for the remark. We have discussed the importance of Knowledge and other Empowerment tools in this section, but haven't specifically focused on social learning through engaging faith-based communities, as this is just one example we found in the literature and it is just one of the ways that social learning can produce empowerment, as shown in the literature review. The reference is included in the text as source for reading for interested people.

Reviewer x3 : ok

RESPONSE: Thank you.



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Reviewer x4 : This section (pages 50-53) provides a comprehensive discussion of the joint application of nature-based solutions and empowerment tools, as well as their outcomes and impacts on empowerment. The writing style is clear and easy to follow.

RESPONSE: *Thanks for the good feedback.*

Reviewer x5 : *no comment*

Reviewer x6 : 6.4.1 page 75: “empowering stakeholders through research” and the three conditions - where did this research-highlight come from? (Why not empowering through planning/decision-making etc?) Assuming that NbS-projects involve research? I miss a framing sentence between previous and following content.

6.4.3 “Munang et al (2013) and Sheng et al (2019), have discovered that NbS can support marginalised groups more than grey-engineering based infrastructure due to its ability to provide socio-economic co-benefits such as supporting livelihoods.” Globally or in which circumstances? I’m pro NbS but in some urban Nordic environments (nature-based) livelihoods wouldn’t have much significance and the co-benefits are something else. Don’t get stuck on this comment - but in 6.4.3. could be good to also refer to coastal regions/communities.

RESPONSE: *Thanks for your remark. We changed the wording of that phrase on 6.4.1 to “Each of these ET holds potential for empowering stakeholders through increased agency (or decision-making authority) and access to resources (i.e., financial, technological, material, information), but their effectiveness relies on specific conditions (Bergold & Thomas, 2012)”. In regard to 6.4.3, we added some sentences specific to coastal areas to make the statement more specific: “In coastal areas, NbS represent an opportunity to align environmental and resilience goals, at a time of strained budgets in a global context and when short-term needs may run counter to long-term goals (Moraes et al., 2022). For instance, NbS can be effective in addressing coastal vulnerabilities in less developed countries, by positively impacting local livelihoods, community health, and agricultural sustainability, thereby offering a context-specific strategy for resilience in the face of climate change (Saddaf et al., 2024).”*

Reviewer x7 : Please see the comment reported in the first question of this form.

RESPONSE: *Thank you. We have taken into account some of those comments.*

Reviewer x8 : Ok

RESPONSE: *Thanks.*

Reviewer x9 : It is not clear what sub-section addresses the part of the objective related to “critically assess the outcomes/impacts”. Page 75, first paragraph: why is the focus only on research here? Table 5: again it is not clear if this comes from the analysed literature. It seems a relevant result, but it is only presented in the discussion. If based on the review, it could probably be included in the results.

RESPONSE: *Thanks for your remark. The sub-section that addresses the critical assessment of empowerment outcomes/impacts is 6.4.3, as our results showed that none of the reviewed articles provided evidence of empowerment outcomes, hence the need to measure empowerment, as well as resilience across scales. We have rephrased the subsection heading in the results for clarity, it now reads 5.5.3. Understanding empowerment both as an outcome and as a process.*



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Additionally, we changed the wording of that phrase on 6.4.1 to “Each of these ET holds potential for empowering stakeholders through increased agency (or decision-making authority) and access to resources (i.e., financial, technological, material, information), but their effectiveness relies on specific conditions (Bergold & Thomas, 2012)”. In regard to Table 5, the content of this table is derived from full content analysis of the articles, specifically the ones providing definitions of resilience or in-depth discussion about it. All of these features are somehow mentioned in the Results section, but this table provides a synthesis for the requesters as a take-home message.

Reviewer x10 : Ok

RESPONSE: Thank you.

Reviewer x11 : No further comment.

RESPONSE: Thank you.

Reviewer x12: no comment

Reviewer x13: no comment

6.5. Recommendations for research and policy making

Reviewer x1 : “for citizen engagement and stakeholder collaboration”: Again, this is a rather narrow framing of empowerment - in fact, non-participation and counter-conduct can be a very effective tools for empowerment.

RESPONSE: Thanks for your comment. Firstly, we added a conceptual background chapter, elaborating empowerment theoretically and practically. Secondly, We have improved the wording of this recommendation. Although our definition of empowerment is broader, we think that decentralised governance mechanisms that promote engagement and collaboration are necessary to build resilience; thus, this does not imply that empowerment in only built through collaboration, but there are other ways to foster it.

Reviewer x2 : I think including some of the pictures from the nature based labs, to show how policies are impacting on local communities

RESPONSE: We have taken your comment into consideration, and added some pictures of NBS from living labs in the final report.

Reviewer x3 : ok

RESPONSE: Thanks.



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Reviewer x4 : The recommendations (pages 53-54) are well-supported by the findings and evidence presented in the report. The use of bullet points helps to clearly outline the key recommendations.

RESPONSE: Thank you for your positive feedback.

Reviewer x5 : no comment

Reviewer x6 : Can these be differentiated under research or policy? If a researcher or a policy maker reads the report quickly for results? Would be nice to have an estimate or timeline of how much input the different points need: something that can be implemented/carried out in a few years versus other things that need very long-term engagement.

RESPONSE: Thanks for your remark. This comment was taken into consideration, and we divided the section under research and policy. We also included an executive summary presenting the key findings in a format suitable for policy and decision makers and to summarize the content and recommendations quickly. We acknowledge that a timeline would be extremely useful, however, this would have been difficult to base on our findings and give room for speculation in the worst case. Therefore, we hope to have addressed this comment by restructuring at least partly.

Reviewer x7 : It is not clear what the targeted actors of the recommendations are. The recommendations could be further elaborated and clustered into two groups according to the diversity of requesters, which include EmpowerUS representatives (scientific domain) and Transitions Coastal Labs (policy/civil society domain). In this sense, the report could conclude by giving specific insights on how to build Tailored Empowerment programs in the Transition Coastal Labs (as stated in the second paragraph of section 2.2).

RESPONSE: Thanks for your comments. We took this into consideration, and we divided the section under research (for EmpowerUs representatives) and policy (for the TCL and implementing partners). In regard to the Tailored Empowerment programs, providing insights on how to build these was never part of the original request - yet we see the importance of it and have rephrased the recommendations accordingly, even though we do not use the phrase "Tailored empowerment programmes". We hope to have addressed this comment and that you will find the new recommendations section useful for your work.

Reviewer x8 : Ok

RESPONSE: Thank you.

Reviewer x9 : no comment

Reviewer x10 : Ok

RESPONSE: Thank you.

Reviewer x11 : No further comment.

Reviewer x12: no comment

Reviewer x13: no comment



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7. CONCLUSION

Reviewer x1 : *no comment*

Reviewer x2 : Very well written and thorough report.

RESPONSE: *Thank you for your positive comment.*

Reviewer x3 : ok

RESPONSE: *Thank you.*

Reviewer x4 : The conclusion (pages 55-57) effectively summarises the main findings and recommendations of the report. The writing style is clear and concise, making it easy for the reader to grasp the key takeaways.

The report is well-written and easy to follow. The use of clear language, subheadings, bullet points, and visual aids (figures and tables) helps to organise the information effectively and enhance readability. While some sections could benefit from additional clarity or examples, the report generally avoids excessive jargon and technical language, making it accessible to a wide audience.

RESPONSE: *Thank you so much for this very appreciated comment.*

Reviewer x5 : *no comment*

Reviewer x6 : Very well written! Use this for the Executive summary.

RESPONSE: *Thank you for your advice, we have kept it in mind for the final version of the report.*

Reviewer x7 : Please see the comment reported in the second question of this form.

RESPONSE: *Thank you, we have considered these comments in our final report.*

Reviewer x8 : ok

RESPONSE: *Thanks.*

Reviewer x9 : *no comment*

Reviewer x10 : We be updated based.on 6 2.

RESPONSE: *Thank you for your feedback, we have kept it in mind to develop the final version of the conclusion.*



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Reviewer x11 : No further comment.

Reviewer x12: no comment.

Reviewer x13: *It's a pretty nice work dealing with the common arena of social and nature approaches to conservation and use of resources in order to face coastal challenges. Congratulations to the authors!!!!*

RESPONSE: *Thank you for this motivating feedback.*

8. REFERENCES

Reviewer x1 : *no comment*

Reviewer x2 : Great.

RESPONSE: *Thank you.*

Reviewer x3 : ok

RESPONSE: Thanks

Reviewer x4 : The references section appears to be comprehensive, covering a range of sources from peer-reviewed literature, reports from international organisations, and other relevant sources. They are presented in a clear and organised manner, following a consistent citation style.

RESPONSE: *Thank you for this detailed feedback.*

Reviewer x5 : *no comment*

Reviewer x6 : Check alphabetical order

RESPONSE: *Thank you for your input, we have reworked the references considering this.*

Reviewer x7 : *no comment*

Reviewer x8 : Not available (not part of print I got)

RESPONSE: *Thank you for concern and we are sorry that the references were not available in your document. Please find the whole list of references in the final report.*

Reviewer x9 : *no comment*

Reviewer x10 : *no comment*



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Reviewer x11 : I put my general comments above.

RESPONSE: Thank you, we have considered some of those references in our final report.

Reviewer x12: no comment

Reviewer x13: no comment

ANNEX 1a. Survey sent to the TCLs during the scoping phase

Reviewer x1 : no comment

Reviewer x2 : The annex 1a is complete and verified.

RESPONSE: Thank you.

Reviewer x3 : ok

RESPONSE: Thanks.

Reviewer x4 : Including the survey sent to the Territorial Case Leads (TCLs) during the scoping phase is a useful addition, as it provides transparency and context for the data collection process. The survey question appears to be relevant and well-designed to gather information related to the project's objectives.

RESPONSE: Thank you for your feedback.

Reviewer x5 : no comment

Reviewer x6 : no comment

Reviewer x7 : no comment

Reviewer x8 : Not available

Reviewer x9 : no comment

Reviewer x10 : No comment.

Reviewer x11 : No further comment.

Reviewer x12: no comment

Reviewer x13: no comment



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ANNEX 1b. Answers to the survey sent to the TCLs during the scoping phase

Reviewer x1 : *no comment*

Reviewer x2 : Annex 1b, yes it addresses but some of the answers are being cut, as screenshots are being placed in the report, if possible to please adjust.

RESPONSE: *Thank you for your feedback, we have not included this Annex in this final report, but only a link to an open access document.*

Reviewer x3 : ok

RESPONSE: *Thanks.*

Reviewer x4 : Including the answers to the survey from the TCLs is a valuable addition, as it allows readers to understand the perspectives and inputs from stakeholders involved in the project. This section provides additional context and insights that complement the main report.

RESPONSE: *Thank you. Unfortunately, we have not included this Annex in this final report, but only a link to an open access document.*

Reviewer x5 : They are not quite clear/legible.

RESPONSE: *Thank you for your feedback, we have not included this Annex in this final report, but only a link to an open access document.*

Reviewer x6 : *no comment*

Reviewer x7 : *no comment*

Reviewer x8 : Not available

Reviewer x9 : The results of the survey in this format are not very useful to the reader. Probably they are also not so relevant to the report either. Consider removing or adding a summary of the main findings that were useful to (re-)formulate the request after the scoping phase.

RESPONSE: *Thank you for this input. We have not included this Annex in this final report in the end, but only a link to an open access document.*

Reviewer x10 : No comment.

Reviewer x11 : No further comment.

Reviewer x12: *no comment*

Reviewer x13: *no comment*



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ANNEX 2a. References screened literature - Scientific literature ANNEX 2b. References screened literature - Gray literature

Reviewer x1 : *no comment*

Reviewer x2 : All references and literature were verified and reviewed.

RESPONSE: *Thank you for your detailed review.*

Reviewer x3 : ok

RESPONSE: *Thank you.*

Reviewer x4: ANNEX 2a: Providing a separate annex for the references of the scientific literature screened is helpful for readers who may want to explore the specific sources used in the evidence synthesis. This annex ensures transparency and allows for easy access to the relevant literature.

ANNEX 2b: Similar to Annex 2a, this annex provides a list of the grey literature sources screened, which is useful for readers interested in exploring the non-peer-reviewed sources used in the report. Including scientific and grey literature references demonstrates a comprehensive approach to the evidence synthesis.

RESPONSE: *Thank you for your feedback.*

Reviewer x5 : *no comment*

Reviewer x6 : *no comment*

Reviewer x7 : *no comment*

Reviewer x8 : Not available

Reviewer x9 : Very useful. Consider using numbered lists. It could also be useful to indicate whether the references were relevant to only NbS, only ETs, or both.

RESPONSE: *Thank you for your input. We have numbered the list but not categorised in per relevance to NbS or ET or both. We keep it in mind for a possible another output of our research.*

Reviewer x10 : No comment.

Reviewer x11 : No further comment.

Reviewer x12: *no comment*

Reviewer x13: *no comment*



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ANNEX 3. Table of definitions for the “resilience” concept.

Reviewer x1 : *no comment*

Reviewer x2 : Yes, the table mentions and clearly defines the concept.

RESPONSE: *Thank you for your positive feedback.*

Reviewer x3 : ok

RESPONSE: *Thank you.*

Reviewer x4 : Providing a table of definitions for the “resilience” concept is a valuable addition, as it helps readers understand the various interpretations and perspectives on this key concept. The table format makes it easy to compare and contrast the different definitions.

RESPONSE: *Thank you for this motivating comment.*

Reviewer x5 : *no comment*

Reviewer x6 : Can you clarify in the annex heading that these are definitions found from the literature included in the REA? Otherwise the definitions would need to include more sources like Holling cited on page 35.

RESPONSE: *Thanks for your remark. Yes, indeed the definitions are found from the literature included in the REA. However, if some of these definitions led us to further sources, those complementary sources regarding concretely the definition of "Resilience" were also screened and commented in the report. Thanks for your remark. Yes, indeed the definitions are found from the literature included in the REA. However, if some of these definitions led us to further sources, those complementary sources regarding concretely the definition of "Resilience" were also screened and commented in the Report.*

Reviewer x7 : *no comment*

Reviewer x8 : Not available

Reviewer x9 : *no comment*

Reviewer x10 : Ok

RESPONSE: *Thank you.*

Reviewer x11 : No further comment.



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Reviewer x12: *no comment*

Reviewer x13: *no comment*

ANNEX 4. Complementary analyses about the contribution of distinct NbS approaches to coastal challenges and resilience

Reviewer x1 : *no comment*

Reviewer x2 : Covers, but would be good to talk about the NbS solutions in a bit of detail.

RESPONSE: *Thanks for your comment. We have included a Theoretical background section in which a Box 2 explains the main NbS approaches that we used to classify our articles.*

Reviewer x3 : ok

Reviewer x4 : Including complementary analyses on the contribution of distinct nature-based solutions (NbS) approaches to coastal challenges and resilience is a useful addition, as it provides further insights and details that may not have been covered in the report. This annex demonstrates a thorough and comprehensive approach to the evidence synthesis.

The inclusion of these annexes is a positive aspect of the report, as they provide additional context, transparency, and supporting information for the main findings and conclusions. The annexes are well-organised and relevant to the project's objectives, enhancing the overall quality and comprehensiveness of the report.

RESPONSE: *Thank you for this positive feedback.*

Reviewer x5 : *no comment*

Reviewer x6 : *no comment*

Reviewer x7 : *no comment*

Reviewer x8 : Not available

Reviewer x9 : Perhaps they could be referenced in the main text.

RESPONSE: *Thank you for the feedback. We did not include references to the main text, as some of these analyses are not described over there.*

Reviewer x10 : Ok

Reviewer x11 : No further comment.



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Reviewer x12: *no comment*

Reviewer x13: *no comment*

Any other comments?

Reviewer x1 : I hope the comments are helpful. Some of them relate to the narrow definition of some concepts and the lack of evidence provided for some claims. It is probably too late now, but it would have been useful for the reviewers to assess the robustness of some of the claims reported in the papers. However, I think there is still scope for them to provide evidence of the effectiveness of some of the concepts, processes, and approaches they have reviewed.

RESPONSE: *Thank you for your comment. We have considered it, but analysing the robustness of the evidence was not a criteria in our review. We intended to find literature on outcomes/effectiveness, but there were not too many papers covering this specific topic, and our aim was to depict a comprehensive analysis of all existing literature.*

Reviewer x2 : Maybe include in the review panel meeting, if possible over zoom, some time.

RESPONSE: *Thanks for your feedback. Though, we are not sure what it's meant with this comment.*

Reviewer x3 : *no comment*

Reviewer x4 : In addition to the positive aspects mentioned, it's worth noting that the inclusion of annexes demonstrates a commitment to transparency and thoroughness in the research process. By providing access to the survey questions, responses, screened literature references, and complementary analyses, the report offers readers an understanding of the data collection, analysis, and decision-making processes that contributed to the findings and recommendations presented in the main report.

Furthermore, the clear organisation of the annexes and the alignment of their content with the report's objectives contribute to the overall coherence and credibility of the research. This attention to detail and transparency enhances the report's value as a resource for stakeholders, researchers, and policymakers interested in the socio-economic empowerment of coastal communities and nature-based solutions for resilience.

While the report overall has many positive aspects, there are a few areas that could be improved: 1. In some sections, there could be a need for further clarification or examples to enhance understanding. For example, in Section 5.4 (Objective 2), the discussion on "Empowerment Outcomes" (page 28) could benefit from specific examples to illustrate the concept. 2. In certain sections, the language could be revised to provide clearer explanations of concepts or terms. For instance, in Section 5.5 (Objective 3), the description of the "Living Shorelines" project in Alabama (page 35) could be made more explicit, providing additional context or defining certain terms for better comprehension. 3. The annexes, while valuable additions, could benefit from more detailed explanations or annotations to provide context for readers. This could involve providing brief summaries or explanations of the significance of each annex and how it contributes to the overall report.



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It's important to note that these weaknesses are relatively minor and do not detract significantly from the overall quality of the report. The positive aspects, such as the clear writing style, comprehensive references, and inclusion of annexes, outweigh these minor weaknesses.

RESPONSE: *Thanks for the positive comments overall. The section of empowerment outcomes has been changed only partly, as not very many examples of these outcomes were found. We only found two grey-literature documents that reported methods on how to measure empowerment, which are presented, e.g. in Box 5. In addition, the language has been revised across the whole report to improve readability by different target audiences. Finally, in regard to the Annexes, we have not provided summaries as we think they are self-explanatory. However, in Annexes 2a (scientific peer-reviewed literature) and 2b (grey literature) we included the search queries in the respective repositories/databases for enhanced clarity and repeatability of the work.*

Reviewer x5 : It is a well documented report and shows the Expert Working Group did a good job. I have no comments for the sections I left empty as I think they are okay or have already commented on them earlier.

RESPONSE: *Thanks for your valuable input. Many thanks for your positive feedback.*

Reviewer x6 : Great job! I look forward to the final report.

RESPONSE: *Thanks for the positive feedback. Thank you so much!*

Reviewer x7 : *no comment*

Reviewer x8 : I really enjoyed the report. It gives new and important insight into the objectives, and documents knowledge gaps.

RESPONSE: *Thank you for your feedback.*

Reviewer x9 : *no comment*

Reviewer x10 : It is resourceful as the whole.

RESPONSE: *Thank you for your comment.*

Reviewer x11 : *no comment*

Reviewer x12: My recommendations may encompass more than just a review. However, I understand that my suggestions may not be relevant to your specific goals and context for this report.

RESPONSE: *Thank you for your valuable remarks.*

Reviewer x13: Thanks!!!!

RESPONSE: Thank you