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Ms. Ref. No.: JEMA-D-23-01828R1
Title: From scenario to roadmap: A web-based participatory watershed planning system for optimizing multistage implementation plans of management practice scenario under stepwise investment
Journal of Environmental Management

Dear Dr. Zhu,

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Yours sincerely,

Toan Trinh, Ph.D
Associate Editor
Journal of Environmental Management

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submission so that authorship related changes are made in the revision stage. If your manuscript is accepted, any authorship change will involve approval from co-authors and respective editor handling the submission and this may cause a significant delay in publishing your manuscript.

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Reviewers' comments:

Reviewer #6: Overall, the manuscript presents a comprehensive overview of the significance of watershed planning and the challenges associated with implementing best management practices (BMPs) that satisfy multiple stakeholders. It describes the design of a web-based participatory watershed planning system that enables diverse stakeholders to propose investment constraints and reach a consensus on optimized roadmaps for specific BMP scenarios. The system integrates a BMP roadmap optimization method and provides a user-friendly interface for stakeholders with varying knowledge backgrounds and roles to participate in an iterative workflow. The manuscript outlines the overall architectural design of the web-based system, including three key functional designs: integration of the roadmap optimization method, visualization of roadmaps from spatial and temporal perspectives, and definition of multiple stakeholder roles with diverse watershed management standpoints.
In terms of language and grammar, the manuscript is well-written and there are no major errors. However, there are a few minor changes that could be made to improve clarity, such as rephrasing some sentences to be more concise and removing unnecessary words or phrases.

Major
Major points that require scientific validation or clarification include:
1. The claim of designing a user-friendly web-based participatory watershed planning system needs validation, including the criteria used to determine its user-friendliness and how the system was validated.
2. The study's focus on an agricultural watershed planning case study for soil erosion reduction raises questions about the broader applicability of the system and methodology to other types of watershed management scenarios.
3. The manuscript mentions a BMP roadmap optimization method proposed by Shen et al. that is currently under review (used 25 times in this research), which raises concerns about the validity and effectiveness of the method until it is published and peer-reviewed.
4. The custom system for the Youwuzhen watershed in China, targeting soil erosion for a five-year period (2011-2017), may be considered outdated, and it is unclear why the authors did not validate the methodology to make a clear judgment about the software or web-based system, especially considering the current year is 2023.
5. The manuscript appears to rely heavily on the work of Shen et al. (under review), presenting a descriptive manual for their paper with a detailed step-by-step tutorial for soil erosion as a case study, which may not be suitable for stakeholders. Additionally, the use of external models and approaches from other researchers may distract the reader, and it is recommended to use hierarchical figures or flow charts, and provide small paragraphs to define and justify the statistical methods used.
6. The manuscript's section on the study area and watershed management goal, including the

Youwuzhen watershed's characteristics, may raise concerns about the watershed's suitability for BMP analysis due to its small size and invulnerability to soil erosion due to low slope conditions.

7. The link provided in the manuscript to access the watershed planning system is not functional, which raises questions about the ability to judge the system's performance (I couldn't even register as a citizen).

8. The manuscript's title could be improved to reflect that it is a case study of an agricultural watershed planning system for mitigating soil erosion, along with discussions on technical selections, frameworks, software, programming languages, and the self-developed BMP roadmap optimization suite by Shen et al. (under review), as well as limitations of the web-based participatory watershed planning system.

9. The manuscript's organization may need improvement, as it appears lengthy and may benefit from a more concise structure.

10. The abstract could provide more information about the results and their implications when read in isolation, including the impact and global relevance of the findings for publication in an international journal, as well as the soundness and justification of interpretations and conclusions based on the data.

Section-by-section

1. Introduction: could be improved by more clearly outlining the objectives and aims of the study. Additionally, it would be beneficial to explicitly state the study's contribution to the field.

2. Methodology: could be improved by providing more information on the statistical analysis methods used to analyze the data. Additionally, it would be beneficial to provide a clear description of the variables used in the study.

3. Results: could be improved by providing more interpretation of the results and relating them back to the research question.

4. Discussion: could be improved by more clearly outlining the implications of the study and suggesting future research directions.

5. Conclusion: could be improved by more clearly outlining the study's contributions to the field.

6. Overall, the sections provided are well-written and provide a clear overview of the research problem and its significance. However, the sections could be improved by incorporating the recommendations provided above.

Minor

abstract

Overall, the language and grammar errors are minor and do not significantly affect the scientific content of the manuscript.

in the abstract, line 2 could be rephrased as Planning multistage implementation plans, or roadmaps, based on the spatial distribution of best management practices (BMPs) is essential for achieving watershed management goals under realistic conditions.

In line 7 the phrase optimization need could be rephrased as need for optimization for clarity.

Furthermore, some sentences could be rephrased to improve clarity and flow. For example, in line 8, it could be clearer to say This study designed a user-friendly web-based participatory watershed planning system to assist a diverse group of stakeholders in reaching a consensus on optimized roadmaps.

In line 10, reaching a consensus on optimized roadmaps should be reaching a consensus on the optimal roadmap.

In line 17, few but essential parameters should be a small set of essential parameters.

In line 18, interactively participatory process should be interactive participatory process.

In line 24, multi-stakeholders should be multi-stakeholder.

In line 27, reference for the ease-to-use design should be reference for the user-friendly design.

introductions

Line 35: Add such as before soil erosion and non-point source pollution to improve clarity.

Line 39: Change BMP scenario(s) to BMP scenarios to match the plural usage in the sentence.

Line 59: Replace falls with fall to match the subject-verb agreement in the sentence.

line 60-62, need reference for " this approach cannot further arrange the optimized BMP scenario into multistage implementation plans, "

lines 73-75, need reference "However, this method only loosely combines independent optimization results and does not optimize the roadmap in an overall optimization problem that considers multistage investments"

Lines 95-96 " To facilitate this process, watershed planning system that utilizes user-friendly interfaces for ease of use for stakeholders without " this increase the uncertainty in the model

Line 103: Replace participatory system with participatory watershed planning system to improve clarity.

Basic idea and overall design

Line 114: change participate in proposing to participate in proposing the

line 117, the term see the simplified workflow depicted in the red dashed part in Figure 1 should be separated by commas to avoid ambiguity.

Line 118: add a comma after Figure 1

Line 118: while streamlining the use by inputting can be rephrased as while streamlining the use through inputting.

Line 121: with different knowledge backgrounds and diverse roles to participate can be rephrased as with participants having different knowledge backgrounds and diverse roles.

Line 128 the figure 1 is not explained in the text and it is not clear as a workflow for an average reader, in addition, the figure is too general to be used. figure 2 should be mention in figure 1 for better understanding, and even if you use the graph from other source , you have to summarize it in the text, as a reader we don't have to search about it in other publications

Line 154: on graphical interfaces can be rephrased as on a graphical interface.

Line 166: optimization task can be rephrased as optimization tasks.

Line 168: optimization-related can be hyphenated as optimization related.

Line 181: optimization tool execution can be rephrased as the execution of optimization tools.

Line 122: add a comma after parameters

Line 130: add a period after implementation

In line 131, the word implementation should be pluralized to implementations to match the plural plans.

In line 137, has should be replaced with have to match the plural subject applications.

lines 167-172, it is not clear how the optimization results. obtained "the optimization results. The back-end business logic is the key component that handles all user-, data-, and optimization-related matters by interacting with other components or layers, including data querying, optimization task submission, and data parsing. The BMP roadmap optimization suite encapsulates models and tools of the roadmap optimization method as several interfaces to be loosely coupled with the business logic component (Section 2.3). HTTP server is"

lines 183-185 how and who decide that it is a universal modeling framework

Line 192: change agreed-upon to agreed upon

Line 192: multi-stakeholders can be hyphenated as multistakeholder.

In general, I could not relate figure 2 to figure 1 in section 2 as it is unclear how thy use the same approach and I wonder how the optimization will be achieved

Case study of an agricultural watershed planning system for mitigating

Line 264, I visit the given website " http://easygeoc.net:9091/." and tried to register as a citizen and it was not working on the demo version, in addition to that the page only contains a photos and some basic data that cannot help in the "watershed planning system" evaluation process.

lines 353-354, you can write some headlines here with the reference/citation

Line 265: open-sourced should be open-source.

Lines 370-371, "The first knowledge type is not used in this case study since the roadmap optimization is based a pre-optimized BMP spatial scenario. " This makes this manuscript a tailored one.

Line 282: consistent with the case study settings in the previous study could be revised for clarity to consistent with the settings of the previous study's case study.

Line 293: FileReader reads files could be revised for clarity to The FileReader reads the files.

Experimental design and evaluation

Line 434: Replace actual requirements with specific needs.
line 463, primarily meet should be replaced with meet primarily.
Line 468: Add of before multi-objectives.
lines 470-471, where the sentence structure is a bit complicated.

Conclusions and future works
The section is well-written and mostly free of language and grammar errors.
However, there are a few minor errors, such as preprepared in line 602, which should be pre-prepared, and can not in line 627, which should be cannot.
There are also a few inconsistencies in the use of capitalization, such as agreed-upon in line 599, which should be Agreed-Upon.
Finally, some sentences are quite long and could be broken up for readability.