

Decision: **accept**

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May 24, 2023

EGREEN-00333-2022-02

Structural Analysis of the Central Sumatra Basin Using Geological Mapping and Landsat 8 Oli/Tirs C2 L1 Data

Dear Dr. kausarian,

I am pleased to inform you that your manuscript with the above details is accepted for the publication in EVERGREEN - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy.

Thank you for submitting your work to EVERGREEN - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy.

You shall receive the proof from Evergreen editorial office in due course.

If you have submitted the figures and tables separately, it is necessary to prepare "manuscript.docx" file where the figures and tables are embedded in the designated places without any changes highlighted, and upload it to "Manuscript body" of the "FILES" section for the proof purpose.

We hope to receive your support for EVERGREEN by citing this work and reviewing some manuscripts.

Kind regards,

Kyaw Thu, PhD  
Executive Editor

EVERGREEN - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy  
Indexed by: QIR, Google Scholar, Chemical Abstracts Service (CAS), ProQuest and SCOPUS

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PhD student recruit: [http://www.tj.kyushu-u.ac.jp/en/igses/c\\_education/iei\\_doctor.php](http://www.tj.kyushu-u.ac.jp/en/igses/c_education/iei_doctor.php)

**Review 1:**

**General comments for the author(s)**

**Should the title be improved?**

No Need

**Should the literature review be expanded?**

No Need

**Should the objective be elaborated?**

No Need

**Should the model (e.g. numerical) be improved?**

No Need

**Should the research method be improved?**

No Need

**Should additional results be included?**

No Need

**Should the discussion of results be improved?**

No Need

**Should the conclusion be revised?**

No Need

**Should the language be improved?**

No Need

**Should the length of the manuscript be shortened?**

No Need

**Should the length of the manuscript be extended?**

No Need

The needed revision was completed correctly. I agree that this manuscript may be published.

**Review 2:**

**General comments for the author(s)**

**Should the title be improved?**

No Need

**Should the literature review be expanded?**

No Need

**Should the objective be elaborated?**

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**Should the model (e.g. numerical) be improved?**

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**Should the length of the manuscript be shortened?**

No Need

**Should the length of the manuscript be extended?**

No Need

Dear Respected Authors,

Thank you for considering my feedback from previous review in your manuscripts revisions. After reading your revision carefully, I am happy to inform you that your manuscript is very good and I agree to inform the editor that your manuscript is suitable to publish in this journal.

I hope your manuscript could expand the knowledge in the future. thank you.

## Responses to the Reviewers

### **Reviewer 1:**

General comments for the author(s)

Should the title be improved?

No Need

***Answer: noted with thanks. We updated as the reviewer 3 suggestion. The Title updated to "Structural Analysis of the Central Sumatra Basin Using Geological Mapping and Landsat 8 Oli/Tirs C2 L1 Data"***

Should the literature review be expanded?

Can be

***Answer: noted with thanks. We updated the literature review in Chapter 1 and Chapter 2.***

*"In this study, the objective sought to improve our understanding of the structural framework of the Central Sumatra Basin. The Central Sumatra Basin is a region of great interest to the oil and gas industry, and a better understanding of its geological and structural characteristics could aid in future exploration efforts. The researchers aimed to identify and map the fault structures in the Pulau Padang Village area, which is located within the Central Sumatra Basin, using a combination of remote sensing data and field validation.*

*To achieve this objective, satellite image data and digital elevation models have been used to identify river straightness patterns, lithological offsets, and hill offsets, which are indicators of fault structures. This study also conducted geological mapping and field validation to support this study. Ultimately, this study hoped would provide new insights into the geological history of the Central Sumatra Basin and help to guide future exploration efforts in the region for exploring more oil and gas in this basin."*

Should the objective be elaborated?

Can be

***Answer: noted with thanks. We updated the objective in Chapter 1 and Chapter 2***

***The whole process of the methodologies used in this research can be seen in Fig. 2.***

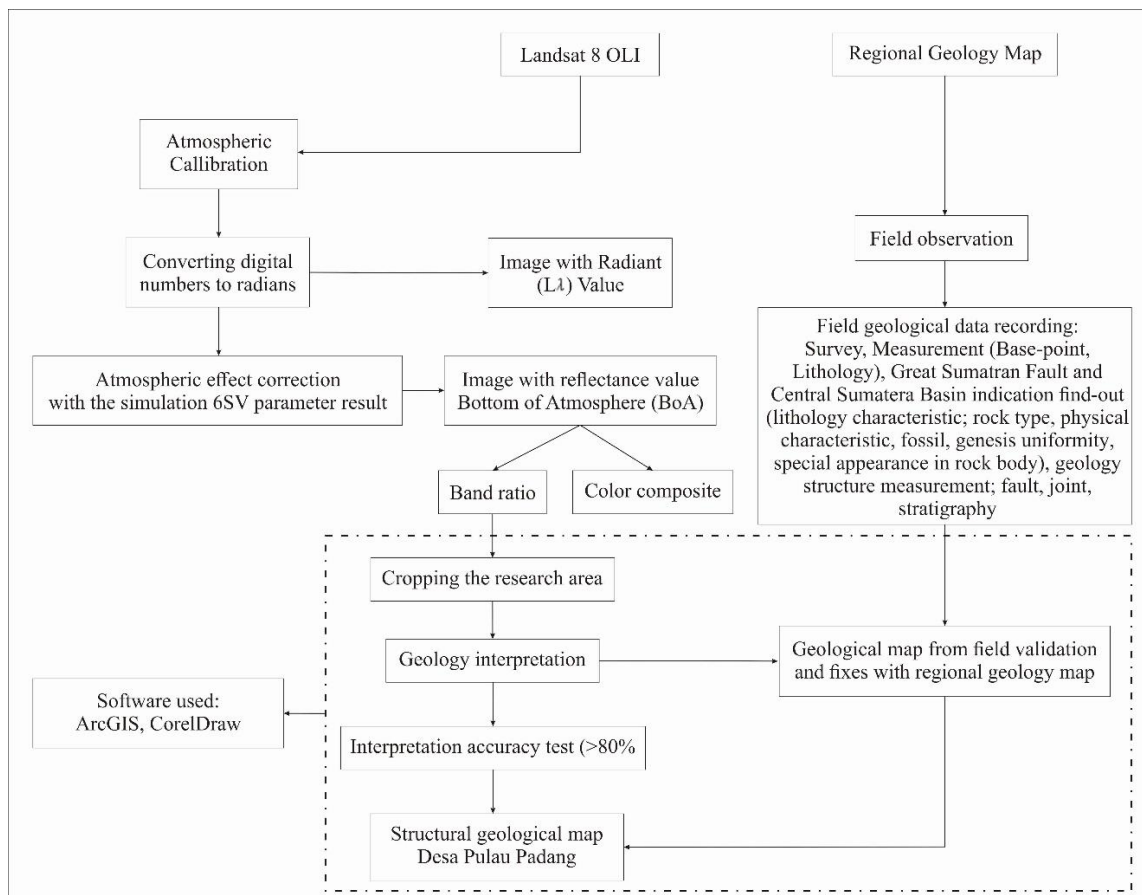


Fig. 2. Flowchart of methodology used in this research.

Should the model (e.g. numerical) be improved?

No Need

**Answer: noted with thanks. We updated the reviewer 2 and reviewer 3 comments.**

Should the research method be improved?

No Need

**Answer: noted with thanks. We updated as the reviewer 3 comment.**

Should additional results be included?

Can be

**Answer: noted with thanks. We updated this on the results and discussion chapter as the reviewer 3 comment**

*The subduction of the oceanic plate under the continental plate in the Sumatra area resulting The Great Sumatran Fault, which forms the Tertiary back-arc basin and knows as the Central Sumatra Basin, which contains economic hydrocarbon deposits. The study of the geological structure is primarily based on the interpretation of the satellite imagery used, complemented by field observations. In this research, the relationship between the deformation of horizontal (dextral) faults and the formation of large basins is known as pull-apart basins. The thrust fault was resulting from the dextral fault.*

*From the analysis of the satellite imagery and geological mapping in the field, it can be found that the mechanism for the formation of relatively small basins is in the horizontal and thrust fault deformation zones. Within this zone, there is movement between blocks that are convergent and divergent (see Fig. 3a, Fig. 6, and Fig. 7) and formed the highs and lows morphologies, respectively (Fig. 4). Based on the interpretation of satellite imagery and field validation, the rock unit distribution map refers to available geological maps, with factual modifications found in the field as seen in Fig. 3a and Fig. 7c.*

*On the edges of the Central Sumatra Basin, there are many oil and gas deposits that are separated distribution. This situation was taken because the dextral fault activity by the Great Sumatran Fault occurred along the island of Sumatra. For the research area, this is proven by the finding of dextral fault structures, thrust fault, and joint structures, as shown in Fig. 3a, Fig. 6, and Fig. 7).*

Should the discussion of results be improved?

No Need

***Answer: noted with thanks. We updated this on the results and discussion chapter, as reviewer 2 commented.***

Should the conclusion be revised?

No Need

***Answer: noted with thanks.***

Should the language be improved?

No Need

***Answer: noted with thanks.***

Should the length of the manuscript be shortened?

No Need

***Answer: noted with thanks.***

Should the length of the manuscript be extended?

No Need

***Answer: noted with thanks.***

the article is good explanation for environmental setting and structure analysis

Review 2:

(this review has file attachment)

General comments for the author(s)

Should the title be improved?

No Need

***Answer: noted with thanks. We updated as the reviewer 3 suggestion.***

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No Need

***Answer: noted with thanks. We updated the literature review in chapter 1 and Chapter 2***

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No Need

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***Answer: noted with thanks. We updated as the reviewer 2 and reviewer 3 suggestions.***

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No Need

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Should the conclusion be revised?

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***Answer: noted with thanks.***

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Can be

***Answer: noted with thanks.***

Should the length of the manuscript be shortened?

No Need

***Answer: noted with thanks.***

Should the length of the manuscript be extended?

No Need

***Answer: noted with thanks.***

Dear Authors,

The paper is well written and organised and is suitable for Evergreen and should produce interest and citations. Please make the changes requested in the comment I have made on the paper.

The English language is overall acceptable but there are some minor grammatical issues, especially mis-use of the definitive article that a thorough edit by an English proficient person would fix. The paper will be acceptable for Evergreen following minor revision and English language editing. Already finish

***Answer: noted with thanks. We already updated our manuscript. For the language and grammar structure, we asked help from our English-spoken colleague. For the comments, we have updated as you mentioned, You can see the comment from your revision text. (the style of consistent writing, revised Figure 2 and Figure 5. For the font of figure and table explanations, we followed the rule from the template that mentioned the font use of Times New Roman with the size of 9)***

Review 3:

General comments for the author(s)

Should the title be improved?

Can be

***Answer: noted with thanks. We updated as the reviewer 3 suggestion. The Title updated to "Structural Analysis of the Central Sumatra Basin Using Geological Mapping and Landsat 8 Oli/Tirs C2 L1 Data"***

Should the literature review be expanded?

No Need

***Answer: noted with thanks. We updated the literature review in chapter 1 and Chapter 2***

Should the objective be elaborated?

Can be

***Answer: noted with thanks. We updated the objective in chapter 1 and Chapter 2***

***"In this study, the objective sought to improve our understanding of the structural framework of the Central Sumatra Basin. The Central Sumatra Basin is a region of great interest to the oil and gas industry, and a better understanding of its geological and structural characteristics could aid in future exploration efforts. The researchers aimed to identify and map the fault structures in the Pulau Padang Village area, which is located within the Central Sumatra Basin, using a combination of remote sensing data and field validation.***

***To achieve this objective, satellite image data and digital elevation models have been used to identify river straightness patterns, lithological offsets, and hill offsets, which are indicators of fault structures. This study also conducted geological mapping and field validation to support this study. Ultimately, this study hoped would provide new insights into the geological history of the Central Sumatra Basin and help to guide future exploration efforts in the region for exploring more oil and gas in this basin."***

Should the model (e.g. numerical) be improved?

Can be

***Answer: noted with thanks. We updated as the reviewer 2 and reviewer 3 suggestions.***

Should the research method be improved?

Can be



***Answer: noted with thanks. We updated as the reviewer 3 comment.***

Should additional results be included?

Can be

***Answer: noted with thanks. We updated this on the results and discussion chapter, as the reviewer 3 comment.***

Should the discussion of results be improved?

No Need

***Answer: noted with thanks. We updated this on the results and discussion chapter, as the reviewer 2 comment.***

Should the conclusion be revised?

Can be

***Answer: noted with thanks. We updated the conclusion chapter as the reviewer 3 comments.***

Should the language be improved?

Can be

***Answer: noted with thanks. We updated the language by asking for help from our English-spoken colleague as the reviewer 3 comment.***

Should the length of the manuscript be shortened?

No Need

***Answer: noted with thanks.***

Should the length of the manuscript be extended?

No Need

***Answer: noted with thanks.***

1. Based on the information provided in the abstract, the title could be improved to more accurately reflect the main focus of the study. While the abstract mentions the environmental setting and field validation as well, the main focus of the study appears to be the structural analysis of the Central Sumatra Basin based on geological mapping and remote sensing data.

A more accurate and concise title could be "Structural Analysis of the Central Sumatra Basin Using Geological Mapping and Landsat 8 Oli/Tirs C2 L1 Data." This title highlights the main focus of the study and includes the key methods used, while still providing a general idea of the research area.

***Answer: noted with thanks. We agreed with reviewer 3 to achieve this title revision. Your suggestion shows how to improve our research objective, and pointing will deliver directly to our aim and receive the readers understanding very well.***

***"In this study, the objective sought to improve our understanding of the structural framework of the Central Sumatra Basin. The Central Sumatra Basin is a region of great interest to the oil and gas industry, and a better understanding of its geological and structural characteristics could aid in***

***future exploration efforts. The researchers aimed to identify and map the fault structures in the Pulau Padang Village area, which is located within the Central Sumatra Basin, using a combination of remote sensing data and field validation.”***

2. The objective of the study could be further elaborated to provide more detail about what the researchers aimed to achieve.

In this study, the researchers sought to improve our understanding of the structural framework of the Central Sumatra Basin. The Central Sumatra Basin is a region of great interest for the oil and gas industry, and a better understanding of its geological and structural characteristics could aid in future exploration efforts. The researchers aimed to identify and map the fault structures in the Pulau Padang Village area, which is located within the Central Sumatra Basin, using a combination of remote sensing data and field validation.

***Answer: noted with thanks. We are very thankful to reviewer 3 for elaborating on the main purpose of our study about how important the Central Sumatra Basin is as the primary producer of oil and gas in Indonesia. By your suggestion, we already updated/elaborated our objective, as you can see in the Introduction chapter.***

***“To achieve this objective, satellite image data and digital elevation models have been used to identify river straightness patterns, lithological offsets, and hill offsets, which are indicators of fault structures. This study also conducted geological mapping and field validation to support this study. Ultimately, this study hoped would provide new insights into the geological history of the Central Sumatra Basin and help to guide future exploration efforts in the region for exploring more oil and gas in this basin.”***

To achieve this objective, the researchers used satellite image data and digital elevation models to identify river straightness patterns, lithological offsets, and hill offsets, which are indicators of fault structures. They also conducted geological mapping and field validation to support their findings. Ultimately, the researchers hoped that their study would provide new insights into the geological history of the Central Sumatra Basin, and help to guide future exploration efforts in the region.

***Answer: noted with thanks. We are very thankful to reviewer 3 for elaborating on the main purpose of our study about how important the Central Sumatra Basin is as the primary producer of oil and gas in Indonesia. By your suggestion, we already updated/elaborated our objective, as you can see in the Introduction chapter.***

3. The method described in the abstract provides a good overview of the data collection, processing, and analysis techniques used in the study. However, there are some areas where the method could be improved to provide more detail or clarity.

For example, while the abstract mentions the use of geological mapping and field observations, it is not clear how these data were collected or analyzed. The method could be improved by providing more detail on the procedures used for geological mapping, such as the types of measurements taken and the methods used to analyze the data.

***Answer: noted with thanks. The suggestion from reviewer 3 has been added to the Methods Chapter as the completion of our research. We completed the process of the methodologies from***

*the geological mapping of the research area used in this research. We added the flowchart of how this research was conducted as the summary to make these methodologies simple to understand.*

*The whole process of the methodologies used in this research can be seen in Fig. 2.*

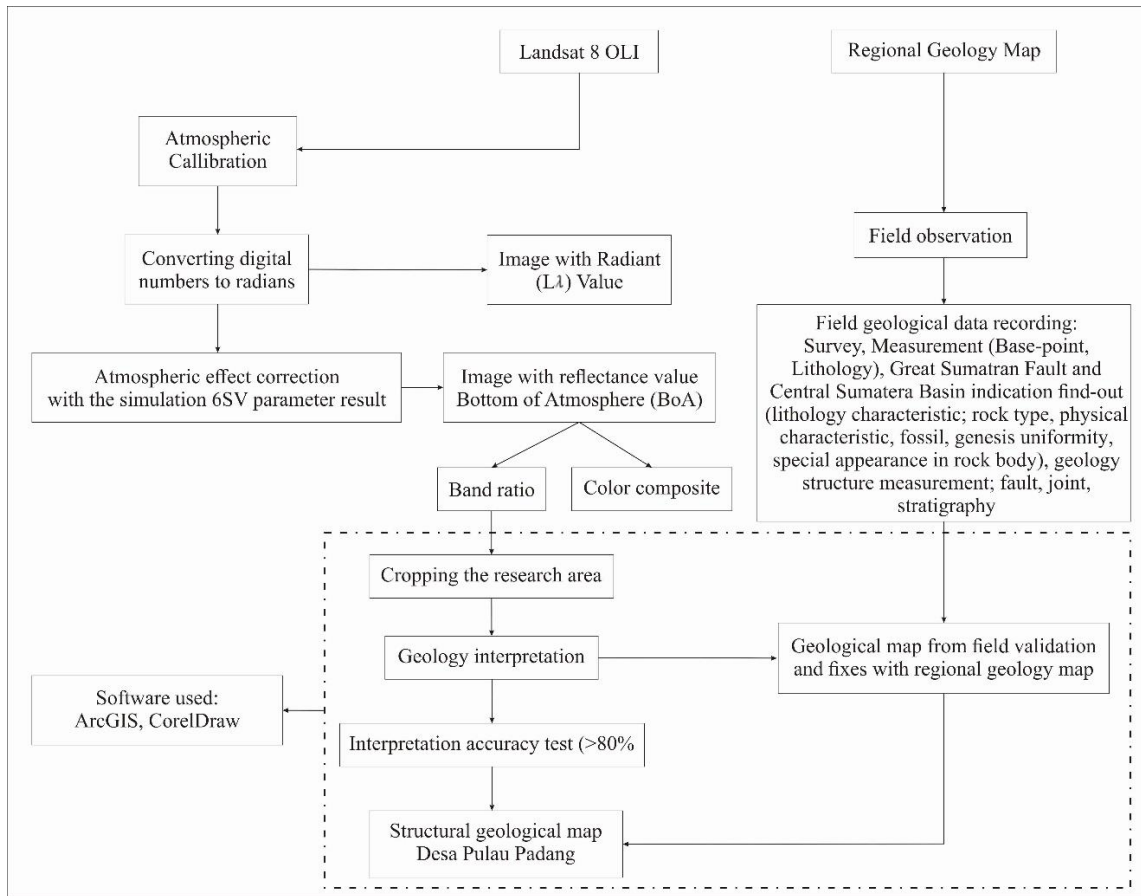


Fig. 2. Flowchart of methodology used in this research.

Additionally, while the abstract mentions the use of Landsat 8 imagery, it could be more specific about the types of data processing techniques used, such as radiometric and atmospheric correction. Providing more detail on the specific software and parameters used for data processing could also improve the clarity of the method section.

***Answer: noted with thanks. The suggestion from reviewer 3 has been added to the Methods Chapter as the completion of our research. We completed the process of the methodologies from Landsat 8 imagery used in this research. We added the flowchart of how this research was conducted as the summary to make these methodologies simple to understand.***

4. The result section provides a brief overview of the findings of the study. However, it could be improved by providing more specific detail on the results obtained and their implications.

For example, the abstract mentions that field observations and geological mapping provided information on the development of geological structures in the research area, but it is not clear what specific structures were identified or how they relate to the formation of the Great Sumatran Fault. The result section could be improved by providing more specific detail on the structures identified,

such as faults, folds, or other geological features, and how they contribute to our understanding of the Great Sumatran Fault.

***Answer: We are very thankful for this suggestion. The correlation between the development of the geological structure in our research area and The Great Sumatran Fault has been added to the Discussion Chapter (we added this sub-chapter to elaborate the explanation of our research result). In our research, we found the development of the geological structure are Dextral Fault, Thrust Fault, and Joint structure. These geological structures are The Great Sumatran Fault products.***

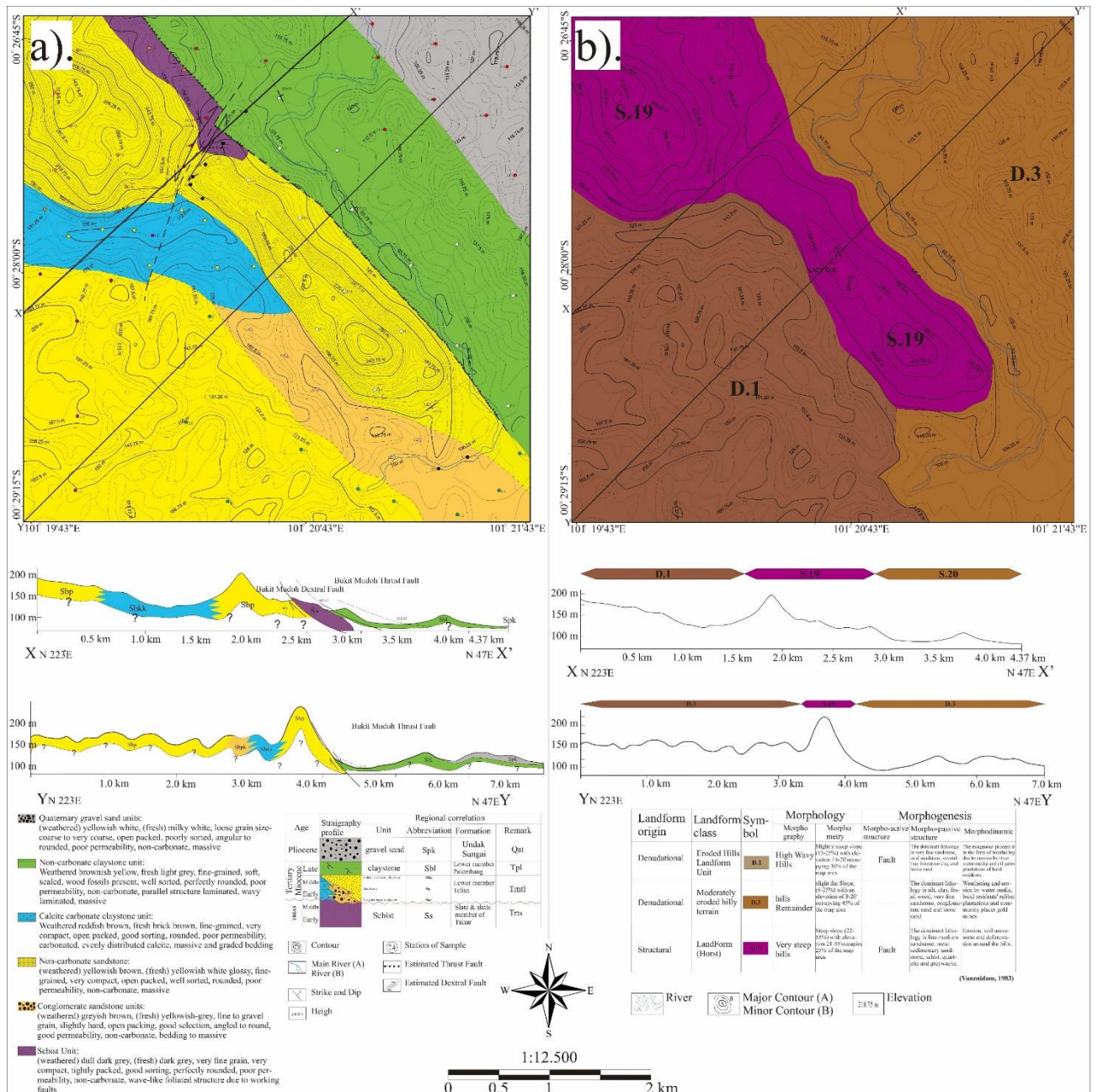
“The subduction of the oceanic plate under the continental plate in the Sumatra area resulting The Great Sumatran Fault, which forms the Tertiary back-arc basin and knows as the Central Sumatra Basin, which contains economic hydrocarbon deposits. The study of the geological structure is primarily based on the interpretation of the satellite imagery used, complemented by field observations. In this research, the relationship between the deformation of horizontal (dextral) faults and the formation of large basins is known as pull-apart basins. The thrust fault was resulting from the dextral fault.

From the analysis of the satellite imagery and geological mapping in the field, it can be found that the mechanism for the formation of relatively small basins is in the horizontal and thrust fault deformation zones. Within this zone, there is movement between blocks that are convergent and divergent (see Fig. 3a, Fig. 6, and Fig. 7) and formed the highs and lows morphologies, respectively (Fig. 4). Based on the interpretation of satellite imagery and field validation, the rock unit distribution map refers to available geological maps, with factual modifications found in the field as seen in Fig. 3a and Fig. 7c.

On the edges of the Central Sumatra Basin, there are many oil and gas deposits that are separated distribution. This situation was taken because the dextral fault activity by the Great Sumatran Fault occurred along the island of Sumatra. For the research area, this is proven by the finding of dextral fault structures, thrust fault, and joint structures, as shown in Fig. 3a, Fig. 6, and Fig. 7).”

Additionally, the abstract mentions that satellite image analysis using Landsat 8 imagery was supportive for making detailed geological maps, but it is not clear what specific information was obtained from the satellite data. The result section could be improved by providing more specific detail on the satellite data analysis techniques used and the types of geological information obtained, such as lithological and structural data.

***Answer: We are very thankful for this suggestion. Based on the interpretation of satellite imagery and field validation, the rock unit distribution map refers to available geological maps with factual modifications found in the field. The methodology that shows how to get this information has been added in the methodology chapter, and the result of the lithological found can be seen in Fig. 3a and Fig. 7c.***



**ig. 3:** a). Corrected Geological Map of Pulau Padang Village from the Field Validation (modified from Silitonga and Kastowo, 1975), b). Geomorphology map of Pulau Padang Village based on the field validation.

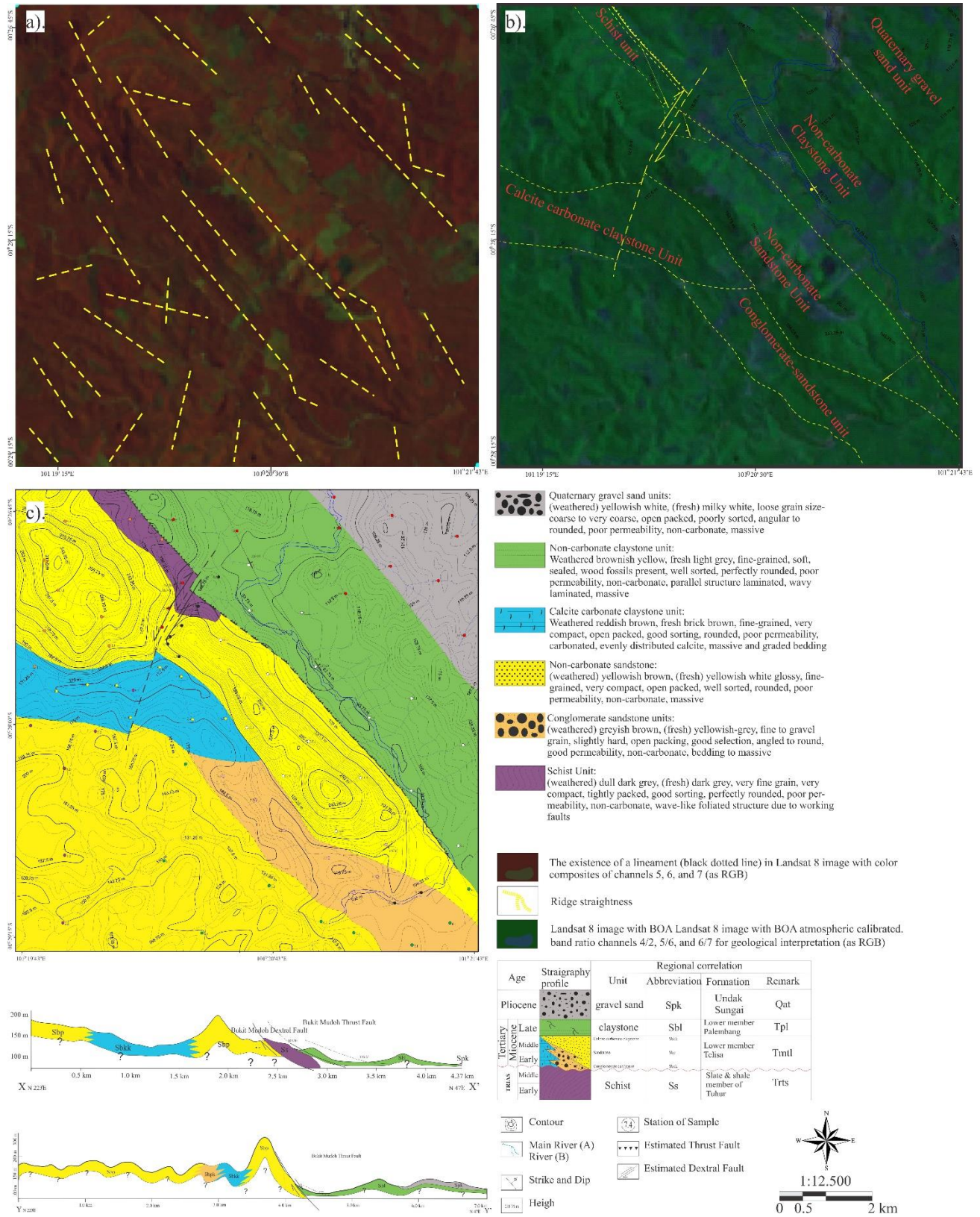


Fig. 7: The Result of Corrected Geological Map in Pulau Padang Village by the Correlation between Field Observation and Validation with Landsat 8 Analysis: a). Map of Lineament Distribution of Pulau Padang Village, b). Map of Structural Distribution of Pulau Padang Village, c). Corrected Geological Map of Pulau Padang Village.

Decision: **major revision**

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April 10, 2023

EGREEN-00333-2022-01

Environmental Setting and Structural Analysis of The Central Sumatra Basin Based on Field Validation, Geological Mapping, and Landsat 8 Oli/Tirs C2 L1

Dear Dr. husnul kausarian,

Thank you for submitting your work to EVERGREEN - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy.

The reviewers have commented on your manuscript. The reviewers indicated that your manuscript is not acceptable for publication in its present form.

However, if you can appropriately address the comments of the reviewers and Editors, we invite you to revise and resubmit your manuscript.

If you are submitting your revised manuscript, please carefully address the issues raised in the comments and do the followings:

(1) Prepare a file "responses.docx" for point-by-point responses/rebuttals to:

(a) each comment of the editor(s)

(b) each comment in the "General comments for the author(s)" and "Information for Authors:" sections of the

reviewers and comments of the editors. It is necessary to provide a response to the points in the "General

comments for the author(s)" if they are checked "Must be".

(c) Upload this file to the "EXPLANATION LETTER" section.

(2) Prepare "manuscriptChangesHighlighted.docx" where all changes addressing the comments of the reviewers and editors are tracked or marked in RED (Please choose "All Markup" if you used Track changes in Word). Upload this file to "Manuscript body with marked changes" of the "FILES" section.

(3) Prepare "manuscript.docx" where all changes are updated but not highlighted and upload it to "Manuscript body" of the "FILES" section.

Please note that that it is necessary to address of the comments of the editor and include them in the "responses.docx" and "EXPLANATION LETTER".

Revision deadline: 2023-05-10

The comments are appended in this email.

Evergreen greatly appreciates if you nominate potential/realistic reviewers who could provide the reviewer service in the manuscript submission form.

We further appreciate if you could provide review services to fellow Evergreen authors.

Kind regards,

Kyaw Thu, PhD  
Executive Editor  
EVERGREEN - Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy  
Indexed by: QIR, Google Scholar, Chemical Abstracts Service (CAS), ProQuest and SCOPUS

Associate Professor  
Department of Advanced Environmental Science and Engineering  
Faculty of Engineering Sciences, Kyushu University,  
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Website: <https://tecs-lab.kyushu-u.ac.jp/~eng/>  
Facebook: <https://www.facebook.com/TECS.Laboratory/>  
PhD student recruit: [http://www.tj.kyushu-u.ac.jp/en/igses/c\\_education/iei\\_doctor.php](http://www.tj.kyushu-u.ac.jp/en/igses/c_education/iei_doctor.php)

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=====  
Decision of the Editor: MAJOR REVISION  
=====  
=====

Comments from the Editors  
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**Review 1:**

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No Need

**Should the conclusion be revised?**

No Need

**Should the language be improved?**

No Need

**Should the length of the manuscript be shortened?**

No Need

**Should the length of the manuscript be extended?**

No Need

the article is good explanation for environmental setting and structure analysis

**Review 2:**

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Dear Authors,

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The English language is overall acceptable but there are some minor grammatical issues, especially mis-use of the definitive article that a thorough edit by an English proficient person would fix.

The paper will be acceptable for Evergreen following minor revision and English language editing. Already finished

**Attachment**

[EGREEN-00333-2022-01\\_batara.docx](#)

**Review 3:****General comments for the author(s)****Should the title be improved?**

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No Need

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No Need

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A more accurate and concise title could be "Structural Analysis of the Central Sumatra Basin Using Geological Mapping and Landsat 8 Oli/Tirs C2 L1 Data." This title highlights the main focus of the study and includes the key methods used, while still providing a general idea of the research area.

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In this study, the researchers sought to improve our understanding of the structural framework of the Central Sumatra Basin. The Central Sumatra Basin is a region of great interest for the oil and gas industry, and a better understanding of its geological and structural characteristics could aid in future exploration efforts. The researchers aimed to identify and map the fault structures in the Pulau Padang Village area, which is located within the Central Sumatra Basin, using a combination of remote sensing data and field validation.

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3. The method described in the abstract provides a good overview of the data collection, processing, and analysis techniques used in the study. However, there are some areas where the method could be improved to provide more detail or clarity.

For example, while the abstract mentions the use of geological mapping and field observations, it is not clear how these data were collected or analyzed. The method could be improved by providing more detail on the procedures used for geological mapping, such as the types of measurements taken and the methods used to analyze the data.

Additionally, while the abstract mentions the use of Landsat 8 imagery, it could be more specific about the types of data processing techniques used, such as radiometric and atmospheric correction. Providing more detail on the specific software and parameters used for data processing could also improve the clarity of the method section.

4. The result section provides a brief overview of the findings of the study. However, it could be improved by providing more specific detail on the results obtained and their implications.

For example, the abstract mentions that field observations and geological mapping provided information on the development of geological structures in the research area, but it is not

clear what specific structures were identified or how they relate to the formation of the Great Sumatran Fault. The result section could be improved by providing more specific detail on the structures identified, such as faults, folds, or other geological features, and how they contribute to our understanding of the Great Sumatran Fault.

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