Review of: "Peatmass Change and Water Level Influencing Regenerated Melaleuca Forest After a Fire in U Minh Thuong National Park, Vietnam"

Saurabh Kumar[1]

1 Suresh Gyan Vihar Univeristy, Jaipur

Potential competing interests: No potential competing interests to declare.

The abstract is informative, but there are some areas where clarity and precision could be improved, particularly in the Method and Results sections. Additionally, providing specific numerical results or statistical findings could enhance the credibility of the study's conclusions.

The introduction provides a good overview of U Minh Thuong National Park, its ecological significance, and the conservation challenges it faces. However, it could benefit from a clearer transition between the park's description and the relevance of peat in forest fire prevention. Additionally, using consistent citation styles and providing specific examples of the park's challenges would enhance the introduction's effectiveness. Concluding with the study's focus and objectives would also provide a clear roadmap for the reader.

Reference to Figure 1 is made but not included in the provided text. It's essential to include the figure or describe its content and purpose.

the methodology outlines the process for collecting data related to peat thickness and forest growth effectively. It could be improved by providing more details about the geographic distribution of plots, specifying the use of peat samples, and explaining how existing data will be incorporated into the analysis. Additionally, including Figure 1 or describing its content is necessary for clarity.

the methodology appears to be well-structured and scientifically rigorous. To ensure correctness, it is essential that the methodology is followed precisely during data collection and analysis, and that any deviations or adjustments are clearly documented. Additionally, the methodology should align with the overall research objectives and questions of the study.

the data analysis section is correct in terms of the statistical methods and tools used. It's essential to ensure that the analysis is conducted rigorously, adhering to the outlined statistical procedures and interpretation criteria. Additionally, the presentation of results in Table 1 is clear and provides valuable information for the study.

Before the forest fire in 2002, the peat layer in U Minh Thuong National Park consisted of two types: black peat at the lower part, tightly compressed, and brown peat on top, with a looser structure and sometimes containing decomposed wood.

After the forest fire, the remaining peat is primarily black, less than 1.3 meters thick, and has compacted soil. This compactness improves water permeability, making it wetter than brown peat. Black peat is more resistant to combustion, except in arid conditions or when far from water channels with low humidity, increasing the risk of forest fires.

the statement accurately presents information about the peat status after the forest fire, including total area and distribution by depth categories. It provides valuable insights into the park's peatland ecosystem.

the statement accurately conveys data about peat reserves after a forest fire and effectively communicates the significance of carbon stored in peatlands in the context of climate change, making it valuable for those interested in peatland ecology and climate-related research and policymaking.

the provided text accurately describes the survey methodology, results, and their relevance, making it a valuable source of information for those interested in U Minh Thuong National Park's peatlands and their conservation.

the results suggest that peat thickness influences pH and nutrient content in peat during the wet season. Thicker peat layers tend to be more acidic and contain higher nutrient levels. However, other compounds like acid humic, SO_4^{2-}, NH_4^+, and Fe^{2+} did not vary significantly with peat thickness.

the findings highlight the significance of peat depth when assessing the chemical composition of peatlands. Researchers and policymakers can use the data in Table 5 to better understand the ecological implications and potential uses of peatlands in different areas and for conservation efforts.

the findings highlight that the chemical composition of peat water can vary significantly depending on depth, with some parameters decreasing and others increasing with increasing depth. Researchers and policymakers can use the data in Table 6 to better understand the ecological implications and potential uses of peatlands in different areas and for conservation efforts.

This information provides valuable insights into how peat thickness relates to the number of trees in the surveyed area. It can be useful for forestry and environmental studies, particularly when examining the impact of soil composition on plant growth

Correlation Equations for Melaleuca Forest on Peatland:

A correlation equation between Hb and Ht is provided, allowing the estimation of tree height (Ht) based on the height under branches (Hdc).

Another equation relates the diameter at breast height ($D_{1,3}$) to tree height (Ht) without direct tree height measurement, offering a practical tool for estimating tree height.

These equations were developed from data collected in Melaleuca forests on peatland in UMT NP, providing useful tools for forest surveys and investigations.

Relationship Between Peat Chemical Factors and Melaleuca Forest Growth After Forest Fire:

The study examines the relationship between acid humic and growth indicators (D1.3, Ht, Hb, and Dc) concerning peat thickness.

Results show no significant correlation between these growth indicators and acid humic, suggesting that acid humic may not significantly impact the growth indicators.

This information is valuable for researchers studying the effects of soil composition on plant growth.

In summary, the provided equations offer practical tools for estimating tree height, while the relationship analysis indicates limited correlation between acid humic and forest growth indicators in the study.

Relationship Between SO42- and Growth Indicators:

No significant correlation exists between acid humic and growth indicators (peat thickness, D1.3, Ht, Hb, and Dc).

Weak correlations (R-values) and non-statistically significant α values (> 0.05) suggest that factors other than those mentioned are more influential in forest growth and acid humic content.

Relationship Between P2O5 and Growth Indicators:

A strong relationship exists between P2O5 and growth indicators (peat thickness, D1.3, Ht, and Hb) with strong correlations ($R > 0.6$).

Statistically significant correlations ($\alpha < 0.01$) imply the importance of P2O5 in influencing these growth indicators.

Dc exhibits a weak correlation with P2O5, indicating other factors may play a more significant role in canopy diameter growth.

Relationship Between pH and Growth Indicators:

A strong relationship exists between pH and growth indicators (peat thickness, D1.3, Ht, and Hb) with strong correlations ($R > 0.7$).

Statistically significant correlations ($\alpha < 0.01$) emphasize the role of pH in influencing these growth indicators.

Dc shows a weak correlation with pH, indicating other factors may be more influential.

Relationship Between Nts and Growth Indicators:

pH exhibits various correlations with different growth indicators.

Strong correlations ($R > 0.6$) exist between pH and peat thickness, D1.3, Ht, and Hb.

Statistically significant correlations ($\alpha < 0.01$) support the importance of pH, except for Dc, where the correlation is weak.

Relationship Between K2O and Growth Indicators:

- pH demonstrates strong correlations ($R > 0.9$) with peat thickness and Ht, and moderately strong correlations ($R > 0.7$) with D1.3 and Hb.
- Statistically significant correlations ($\alpha < 0.01$) underline the significance of pH.
- Dc exhibits a weak correlation with pH, suggesting other influencing factors.

Relationship Between Fe2+ and Growth Indicators:

- pH correlates strongly with most growth indicators (peat thickness, Ht, Hb, and D1.3) with R-values greater than 0.7, indicating a positive correlation.
- Statistically significant correlations ($\alpha < 0.01$) highlight the importance of pH.
- The exception is Dc, which shows a weak correlation with pH.

Conclusions:

- Peat thickness and flooding regimes significantly impact Melaleuca forest growth.
- Peat chemical composition, including nutrients and pH, also plays a critical role.
- Peat water composition varies with seasons, affecting forest growth.
- Effective forest restoration strategies must consider these factors for successful regeneration while managing fire risks and biodiversity.