Research Report

Carbon Sequestration of Sri Trang trees and White Samet trees in the Botanical garden at Wichienmatu School, Trang Province

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Abstract

This study aimed to examine the carbon sequestration of Sri Trang trees and White Samet trees in the botanical garden at Wichienmatu School, Trang Province. Measurements of the circumference and height of both tree species were conducted, and the data were used to calculate carbon sequestration using a carbon storage calculation program. The results indicated that White Samet trees had a higher carbon sequestration capacity than Sri Trang trees.

Keywords: Climate, Carbon dioxide levels, Tree circumference, Tree height

Introduction

Forest resources are crucial in Thailand, playing a vital role in sustaining life and maintaining the balance of nature. Forests significantly impact our planet by helping to mitigate global warming, exchanging carbon dioxide, preserving soil, and storing carbon. They absorb carbon dioxide from the atmosphere, which results from greenhouse gas emissions and global warming. Additionally, forests serve as essential sources of gas exchange for living organisms, contributing to ecological stability.

Studying the carbon storage capacity of trees is essential for conservation efforts. Wichienmatu School, a part of the botanical garden project, has a large number of trees, making it an ideal location for such research.

This study focuses on two tree species Sri Trang trees and White Samet trees. Sri Trang is the symbolic tree of Trang Province, while White Samet represents Wichienmatu School in Khuan Lobb Subdistrict, Mueang District, Trang Province. Our group aims to investigate the carbon storage capacity of these two tree species, utilizing the findings to support natural resource conservation and environmental restoration.

Research Question

How do the carbon sequestration capacities of the Sri trang tree and the White Samet differ?

Research Hypothesis

The carbon sequestration capacities of the Sri trang tree and the White Samet are different.

Variables

Independent Variable : Sri Trang trees, White Samet trees

Dependent Variable : Amount of carbon sequestration

Controlled Variables : Weather conditions, time period, sequestration method

Materials and Equipment

1. Clinometer
2. Measuring tape
3. Measuring rope

Research Methodology

1.Selecting the Study Area : The study area is designated within the botanical garden of Wichienmatu School, Trang Province.

Sri Trang Tree: Located at Latitude: 7.50419592° N, Longitude: 99.6301057° E.

White Samet Tree: Located at Latitude: 7.5042255° N, Longitude: 99.6301644° E.

2.Measuring Circumference :

The circumference and diameter of five selected White Samet and Sri Trang trees are measured. The measurements are taken using a measuring tape at breast height (1.30 meters above ground level).

3.Steps for Calculating Tree Height :

Five White Samet and five Sri Trang trees are selected for height measurement. These trees must be tall trees (4–5 meters high) and located on the same ground level as the observer.

-The height is measured using a measuring tape and a clinometer, following these steps:

3.1Record the distance (AC): Measure and record the horizontal distance from the observer to the base of the tree.

3.2Measure observer's eye level height: Measure and record the observer's height from the ground to their eye level.

3.3 Measure the angle of elevation (BAC): Look through a plastic tube attached to the clinometer and align it with the tree's highest point. The weighted string will align due to gravity, providing the angle of elevation (BAC), which should be recorded.

4.Calculating Tree Height:

The height of the tree (meters) = (Distance (meters) × Tangent of the angle of elevation BAC) + Height from the ground to the observer's eye level (meters).

Research results

Record table

Part1 : Showing the carbon storage capacity of the Sri Trang tree in the botanical garden of Wichianmatuth School, Trang Province.

Sri Trang tree			
Order	Circumference (Cm)	Height (M)	Carbon storage capacity (KgC)
1	120	21.04	459.58
2	76	11.6	110.49
3	132	29.9	766.61
4	105	16.6	285.57
5	122	21.28	479.25
Overall average carbon sequestration capacity			420.3

Part2 : Showing the carbon storage capacity of the White Samet tree in the botanical garden of Wichianmatuth School, Trang Province.

White Samet tree			
Order	Circumference (Cm)	Height (M)	Carbon storage capacity (KgC)
1	260	11.73	1140.05
2	128	12	305.56
3	125	14.35	345.92
4	170	10.7	468.53
5	130	9.6	254.86
Overall average carbon sequestration capacity			502.984

Summary and Discussion of Research Findings

The study found that the White Samet tree had an average carbon dioxide sequestration of 502.984, which was higher than that of the Sri Trang tree. This conclusion was drawn from an experiment conducted on five trees of each species.

Recommendations

Further research should be conducted on the carbon sequestration capacity of other tree species to identify those that are most effective in absorbing carbon dioxide. This could help guide the selection of suitable trees for plantation and environmental conservation.

Acknowledgements

The environmental research project on carbon sequestration of the Sri Trang trees and White Samet trees in the botanical garden of Wichienmatu School, Trang Province, has been successfully completed with valuable guidance and consultation. This support has enabled the research team to refine and resolve challenges, ensuring the completeness of this study. We believe that this project will contribute to future research and education.

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Reference Document

Nualsri, C., Na Takua Thung, C., & Maelim, S. (2024). Carbon sequestration of trees in public parks within Tak Municipality, Tak Province. Thai Journal of Forestry, 43(1), 152–166. Retrieved from [source].

https://li01.tci-thaijo.org/index.php/tjf/article/view/261830

Software for Calculating Carbon Dioxide Sequestration of Sri Trang Trees and White Samet Trees

https://me-qr.com/TG8qrzLp

GLOBE THAILAND (Principles for Measuring Land Cover, Tree Height, and Circumference)

https://globefamily.ipst.ac.th/globe-protocols/biosphere

Appendix