The study of carbon storage of prominent plant species in the summer and rainy seasons of Bang Rak ,Trang

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abstract

This research aims to study of carbon storage of prominent plant species in the summer and rainy seasons of Bang Rak ,Trang, White cheese wood Tree, Indian oak, Yang Na Tree and sentang to compare the carbon sequestration of the dominant tree species in the summer and rainy season in Bang Rak. Summer in February -March 2023 and during the rainy season in July - August 2023, the authors collected tree data using the GLOBE observer trees height app, i.e. height and circumference of trees, and then used the data to calculate the biomass of trees and analyze the amount of carbon sequestered in trees according to the principle of the allometry equation. Carbon-Storage app The results showed that the growth of each dominant plant species The height, circumference and amount of rainy season carbon storage are higher than in summer for all varieties and there are statistically significant differences. The dominant tree with the highest average increase in height is sentang, Indian oak tree is the dominant tree with the highest average increase in circumference, and Indian oak tree has the highest increase in carbon sequestration over summer, accounting for 40.19 percent.

Keywords : Notable plant species Carbon sequestration volume

Research Question:

1. The prominent trees of each type in Bang Rak Subdistrict, Trang Province include White cheese wood T r e e , Indian oak, the Yang Na tree, and sentang. How is there a difference in growth?

2. The summer and rainy seasons affect the carbon storage of each important tree type in Bang Rak District, Trang Province, including White cheese wood Tree, Indian oak, the Yang Na tree, and sentang. How are they different?

Introduction:

Thailand has 7,255 parishes nationwide, all of which have space to plant trees to create green spaces and create a shady atmosphere. If every parish planted 10 or 100 trees with the best carbon sequestration, Thailand can absorb carbon dioxide to store it in the form of tree biomass.

Planting trees to create green spaces is one way to reduce the amount of carbon dioxide in the air. It undergoes the process of photosynthesis of trees and is stored in cellulose form (Khan et al., 2007). Carbon dioxide is deposited in various parts of plants in the form of biomass (Redondo-Brenes & Montagnini, 2006; They are collected in the form of biomass in both the aboveground (stem, branches, leaves) and underground (roots). This causes carbon to be fixed in the trees until the trees are cut down from the area.

Bang Rak, Trang is a model of green space filled with a lot of plants. There are 4 types of dominant plants: Phaya Satban, Yang Na, Water Peck, and Neem Tree. The organizers are interested in studying the diversity of dominant plant species in Bang Rak Subdistrict, Trang Province. The growth of each dominant tree species in the parish was studied using the GLOBE observer trees height app to measure the height and circumference of trees. Study the carbon sequestration of each dominant tree species in the parish using the Carbon-Storage app. From the allometry equation The allometric equation of Kira and Shidei (1967) is used to inform the selection of the dominant plant species that can best store carbon content. This helps Thailand increase green areas in the sub-districts and helps absorb carbon dioxide and release oxygen in natural dharma enormously.

1 Materials

1. Tape measure
2. GLOBE observer application
3. Carbon-Storage application

Methods

Part 1 Study point determination

This research was conducted at 196 Moo 4, Trang Road-Sikao, Bang Rak Subdistrict, Mueang Trang District, Trang Province. Located at latitude 7.5528442, longitude 99.5583281.

Part 2 Timing and study points of dominant plants

The research team conducted a study of the dominant plants at Bang Rak , Trang in in the summer and rainy season in Bang Rak. Summer in February -March 2023. The dominant plant species in the study were divided into 4 types which are White Cheesewood, Indian Oak, Yang, and Sentang as shown in the picture.

Picture 1 shows the dominant plant species.
White Cheesewood, Indian Oak, Yang, and Sentang, respectively

Part 3 The study of the growth of the trees

1. Start by studying White Cheesewood, Indian Oak, Yang, and Sentang, respectively. We use the GLOBE observer application by choosing the GLOBE observer trees height application to measure the height of each tree. Start shooting from the base, top, and including the tree.
2. Measure the circumference of each stem by measuring 135 cm. above the ground. In case of further separation of stems, measure every separate stem and add up the total length of the circumference, then divide by the number of separated stems.
3. Observe the appearance of the leaves and flowers, then save all the information to Google sheet.
4. Designate locations of trees in each area by representing White Cheesewood as A, Indian Oak as B, Yang as C, Sentang as D, as in the example.

Picture 2 shows White Cheesewood and Indian Oak.

Picture 3 shows Yang and Sentang

Part 4 Carbon Credit Calculation

1. Calculate carbon credits using the Carbon-Storage app.

2. Get started by calculating the carbon credits of White Cheesewood. Select the forest type, choose “large tree”, then choose the evergreen forest, then enter data of the diameter and height of each tree. When you're done, press “add”.
3. Calculating the carbon credits of Indian Oak. Click “tree” and select “another plant”, then enter the diameter and height of each tree. When you're done, press “add”.
4. Calculating the carbon credits of Yang. Select the forest type, choose “large tree”, then choose the dry evergreen forest, then enter the diameter and height of each tree. When you're done, press “add”.
5. Calculating the carbon credits of Sentang. Click “tree” and select the neem tree, then enter the diameter and height of each tree. When you're done, press “add”.

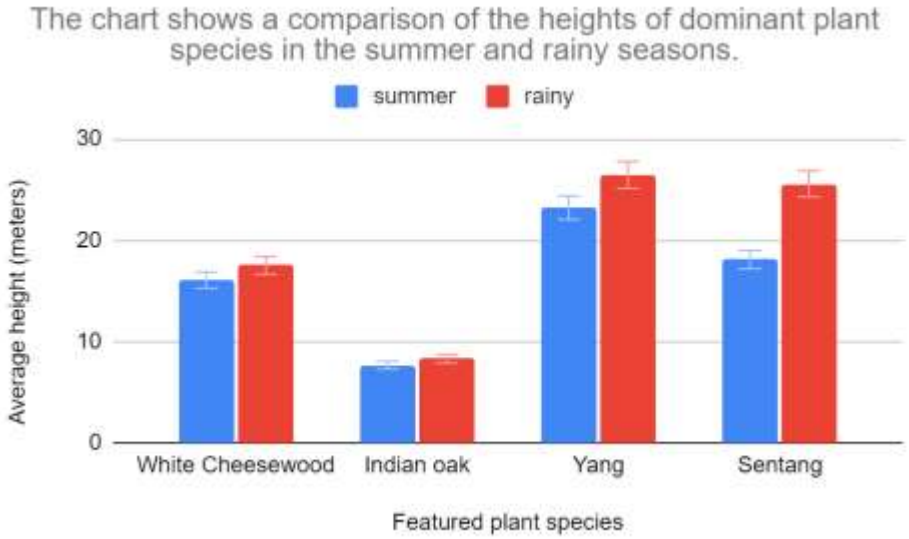
Data analysis

- average
- pair sample t-test

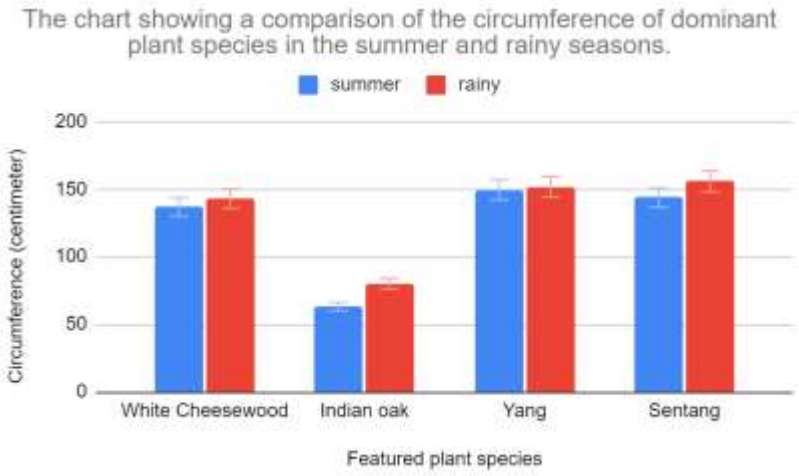
Results:

Preparation of a science project on the study of variation in the amount of carbon storage in plant dominant species at Princess Chulabhorn Science High School Trang is divided into 3 parts, as follows

Part 1 Study the growth of each dominant plant species in Bang Rak, Trang.

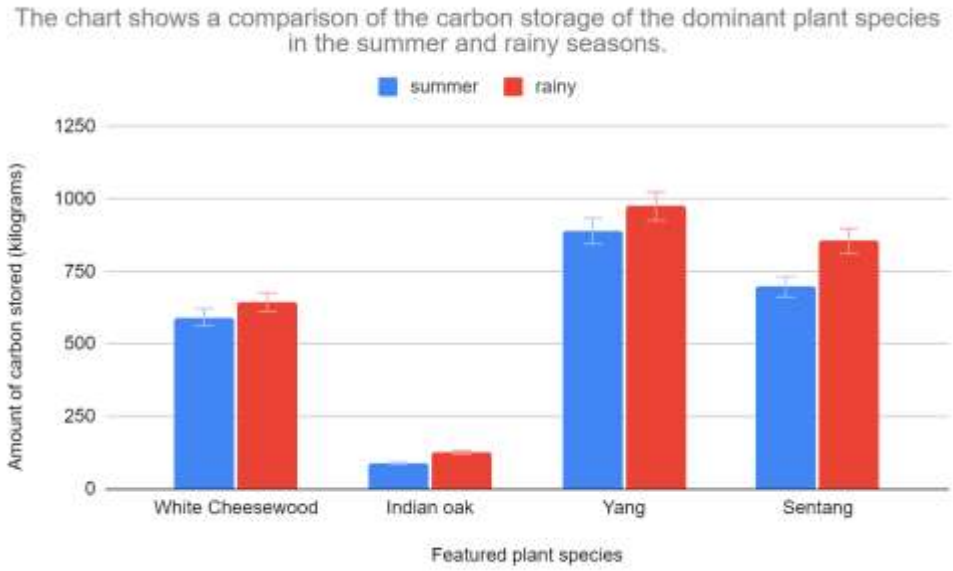


picture 4: shows a bar chart showing the average height of a dominant plant species. Each species in Bang Rak, Trang



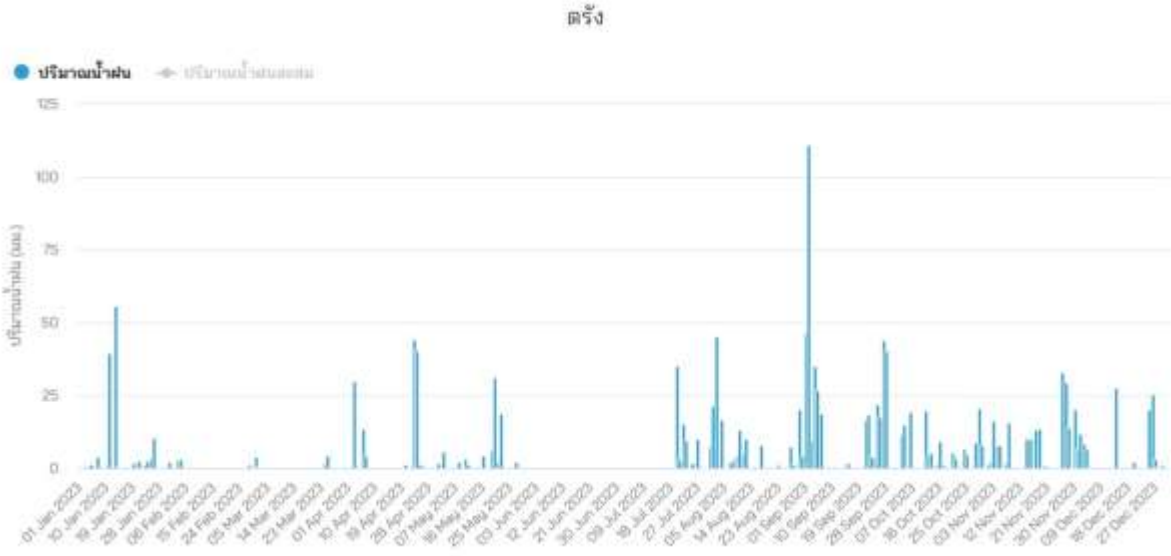
picture 5: shows a bar chart showing the average circumference of a dominant plant species. Each species in Bang Rak , Trang

Part 2 Study the carbon sequestration of each dominant tree species in Bang Rak Subdistrict, Trang Province.



picture 6 : shows a bar chart showing a comparison of the carbon sequestration of dominant plant species.Each species in Bang Rak, Trang

Part 3 Studying rainfall to observe the seasons



Picture 7 : Table showing rainfall in Bangrak , Trang 2023

Conclusion:

Growth of each dominant plant species in Bang Rak, Trang The summer period in February - March 2023 and the rainy season in July - August 2023 have different values for all species and there are statistically significant differences. The dominant plant with the largest increase in average height is sentang, and the dominant plant species with the highest average circumference is Indian oak.

Carbon sequestration of each dominant tree species in Bang Rak The summer period in February - March 2023 and the rainy season in July - August 2023 have seen an average increase in all varieties and there are statistically significant differences. During the rainy season, the dominant tree species with the largest increase in carbon sequestration is the Indian oak , which increased by 40.19 percent.

Acknowledgments

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Badges:

I am a collaborator: Of course, we are not able to do all of this on our own. After we finish the results and the slide presentation, we contact Dr. Mallika Charoensuthasini, professer of science and a center for specialized knowledge in ecology, forecasting and management from Walailak university. Mrs. Patchara Pongmanawut and Mrs. Sirikwan Nuphuti, Advisors from Princess Chulabhorn Science High School Trang to present and consult about our results and presentation. Department of environmental quality promotion help us to calculating the carbon credits. GLOBE organisation to measure the height and circumference. So, we can improve our slide presentation and results.

I make an impact: We found problem of global warming. Global warming is caused by greenhouse gases in the atmosphere. One of the major greenhouse gases is carbon dioxide. So, we study the growth of each dominant tree species in Bang Rak, namely, White Cheesewood, Indian Oak, Yang and Sentang to study the carbon storage of each dominant tree species in the school. This research can help Thailand to increase green areas in Distract and absorbs enormous amounts of carbon dioxide and releases oxygen in nature. The dominant tree with the highest average increase in height is sentang, Indian oak tree is the dominant tree with the highest average increase in circumference, and , Indian oak tree

has the highest increase in carbon sequestration over rainy season, accounting for 40.19 percent.

I am a data scientist: During The summer period in February - March 2023 and the rainy season in July - August 2023, we collected data which are tree height and tree circumference by using GLOBE observer tree height app and analysis the data by using the pair sample t-test. We are able to know the growths of each dominant tree species. Using the GLOBE database and the pair sample t-test, we use carbon storage app to calculating the carbon credits. We were able to create multiple graphs and draw conclusions about dominant tree species

GLOBE visualization page: Tree Heights