**Research Report**

# A study of carbon sequestration in The Ivory Coast Almond trees (Terminalia catappa trees) within the grounds of Varee Chiang Mai School


**Researchers**

| | |
|---|---|
| **Miss Pinyada** | **Laopanrak** |
| **Miss Ramita** | **Yosang** |
| **Miss Ploylalin** | **Saranak** |
| **Miss warittha** | **Suriyasak** |
| **Mister Napop** | **Kadeedang** |
| **Miss Phatnicha** | **Pamoon** |

**Advisors**

| | |
|---|---|
| **Miss Duangdee** | **Kaewdee** |
| **Mrs. Paweena** | **Aowrattanakul** |
| **Miss Panita** | **Chenrukmatupoom** |
| **Miss Paphatrada** | **Piyawarawat** |



**2026 Virtual Science Symposium (VSS)**

**January 2026**

**For Globe Student Research Competition (GLOBE SRC) 2026**

**Research Title:** A Study of Carbon Sequestration in the Ivory Coast Almond Trees (Terminalia catappa trees) within the grounds of Varee Chiang Mai School


**Research Committee:**

| | |
|---|---|
| Miss Pinyada | Laopanrak |
| Miss Ramita | Yosang |
| Miss Ploylalin | Saranak |
| Miss Warittha | Suriyasak |
| Mister Napop | Kadeedang |
| Miss Phatnicha | Pamoon |

**Grade Level:** Lower Elementary

**Research Advisors**:

| | |
|---|---|
| Miss Duangdee | Kaewdee |
| Mrs. Paweena | Aowrattanakul |
| Miss Panita | Chenrukmatupoom |
| Miss Paphatrada | Piyawarawat |

**School:** Varee Chiang Mai School, Mueang District, Chiang Mai Province

**Abstract**

This research aims to study the carbon sequestration potential of The Ivory Coast Almond trees (Terminalia catappa trees) within the grounds of Varee Chiang Mai School , focusing on evaluating the amount of carbon stored in these trees, which are common perennials in the study area. The research was conducted using field surveys to measure tree circumference, determine trunk diameter, and measure tree height. This data was then used to calculate the accumulated carbon storage. The results indicate that The Ivory Coast Almond trees (Terminalia catappa trees) in the Varee Chiang Mai School area have a significant carbon sequestration potential. Specifically, trees with larger diameters and greater heights were found to have a higher capacity for carbon sequestration compared to smaller trees. This demonstrates the vital role of perennials in school green spaces in reducing atmospheric carbon dioxide. The findings of this research can serve as fundamental data for promoting tree conservation, increasing green spaces in educational institutions, and sustainably raising awareness about climate change mitigation among students and the surrounding community.

**Key Words**: Ivory Coast Almond Tree (Terminalia catappa trees), Carbon sequestration capacity of trees

**Acknowledgements**

The research study on carbon sequestration in The Ivory Coast Almond trees (Terminalia catappa trees) within the grounds of Varee Chiang Mai School was successfully completed through the support and facilities provided by Ajarn Varee Patravanich, Director of Varee Chiang Mai School.

We would like to express our sincere gratitude to our research advisors: Miss Duangdee Kaewdee, Mrs. Paweena Aowrattanakul, Miss Panita Chenrukmatupoom, and Miss Paphatrada Piyawarawat, for providing their expertise in data collection and for their invaluable advice and guidance throughout the project. We also wish to thank our parents for their continuous support, encouragement, and motivation during the entire research process.

Finally, the research team would like to thank the authors of all academic documents, journals, websites, and previous research works cited in this study. We are deeply grateful for your contributions.

**The Research Team**

**Table of Contents**

## List of Figures

## List of Tables

# Chapter 1

# Introduction

## Background and Significance

Currently, the greenhouse effect is a critical environmental issue that significantly impacts the global climate, leading to a rise in the Earth's average temperature, known as global warming. A primary cause of this phenomenon is the increasing concentration of carbon dioxide ($CO_2$) in the atmosphere, resulting from human activities such as the burning of fossil fuels, transportation, and deforestation.

Trees play a vital role in mitigating global warming because they can absorb carbon dioxide from the atmosphere through the process of photosynthesis. The carbon is then stored as biomass in various parts of the tree, including the trunk, branches, leaves, and roots. This process is known as "Carbon Sequestration," which helps reduce greenhouse gases and maintains ecological balance.

The Ivory Coast Almond trees (Terminalia catappa trees), or "Hu Kra Jong," is a popular perennial species planted in schools and public spaces due to its wide, tiered canopy that provides excellent shade. While Varee Chiangmai School has a large number of these trees, there is currently a lack of specific data regarding their carbon sequestration capacity.

Therefore, this research aims to evaluate the amount of carbon stored in these trees to provide scientific data that promotes environmental awareness and supports sustainable development within the school community.

## Research Objectives

1. To study and calculate the amount of carbon sequestration in Ivory Coast Almond trees at Varee Chiangmai School.
2. To analyze the relationship between tree size (Diameter at Breast Height and height) and carbon sequestration capacity.
3. To evaluate the role of these trees in reducing carbon dioxide levels within the school environment.
4. To raise awareness about environmental conservation and global warming among students and staff.

**Research question**

How do the size and structure of trees within the Varee Chiang Mai School area relate to the amount of carbon sequestration?

**Research Hypotheses**

1. Trees of different sizes and ages within the school will sequester different amounts of carbon.
2. Trees with larger diameters and greater heights will have a higher capacity for carbon sequestration than smaller trees.
3. Planting and maintaining these trees effectively contributes to lowering $CO_2$ levels in the school's atmosphere.

**Expected Benefits**

1. To clearly determine the amount of carbon sequestration in Ivory Coast Almond Trees within the Varee Chiang Mai School area and utilize this data as a guideline for environmental conservation.
2. To confirm that Ivory Coast Almond Trees with larger trunk sizes and greater heights have a higher capacity for carbon sequestration than smaller trees, consistent with the proposed hypotheses.
3. To obtain empirical evidence regarding the role of Ivory Coast Almond Trees in reducing atmospheric carbon dioxide levels within the school grounds.

**Scope of Research**

**1. Area Scope** This research focuses on the study of 5 Ivory Coast Almond Trees planted within the grounds of Varee Chiang Mai School, Chiang Mai Province.

**2. Population and Sample Scope**

- **Population:** The population used in this research consists of 5 Ivory Coast Almond Trees located within the Varee Chiang Mai School area.
- **Sample:** The sample group consists of 5 Ivory Coast Almond Trees that are accessible and suitable for measurement, selected through Purposive Sampling.

**3. Content Scope** This study focuses on calculating the carbon sequestration capacity of Ivory Coast Almond Trees based on tree dimensions, including Diameter at Breast Height (DBH) and total tree height.

**4. Time Scope** The research was conducted from November 2025 to February 2026.

# Chapter 2

# Literature Review and Related Research

## Literature Review and Related Research

The study of carbon sequestration in Ivory Coast Almond Trees within the grounds of Varee Chiang Mai School requires the application of concepts, theories, and related research works. These serve as a foundation for establishing the study framework, data collection, and research analysis. The relevant documents and research are categorized into the following key topics:

### 2.1 Concepts of Global Warming and Greenhouse Gases

Global Warming is a phenomenon characterized by a continuous increase in the Earth's average surface temperature due to the accumulation of greenhouse gases in the atmosphere. Greenhouse gases have the property of absorbing and trapping heat from solar radiation, causing heat to build up within the atmosphere. This leads to climate change, such as rising temperatures, unseasonal rainfall, droughts, and floods.

Important greenhouse gases include Carbon Dioxide ($CO_2$), Methane ($CH_4$), and Nitrous Oxide ($N_2O$). Carbon dioxide is considered the primary greenhouse gas with the highest volume and is generated by human activities, such as the burning of fossil fuels, transportation, electricity production, and deforestation.

**2.2 Carbon and the Carbon Cycle** Carbon is a vital element for all living organisms and circulates in nature through a process known as the "Carbon Cycle." This cycle consists of the exchange of carbon between the atmosphere, plants, animals, soil, and water bodies.

Plants play a crucial role in the carbon cycle by absorbing carbon dioxide from the atmosphere through the process of photosynthesis and converting it into nutrients for growth. The absorbed carbon is stored in various parts of the plant, such as the trunk, branches, leaves, and roots. When plants live for a long duration, carbon is sequestered for an extended period, resulting in a reduction of carbon dioxide levels in the atmosphere.

### 2.3 Carbon Sequestration of Trees

Carbon Sequestration refers to the process by which trees absorb and accumulate carbon within their plant biomass. Large, long-lived, and healthy trees are capable of sequestering significant amounts of carbon. The amount of carbon sequestration in trees depends on several factors, such as:

- Tree species
- Diameter at Breast Height (DBH)
- Tree height
- Age of the tree

The growing environment Generally, trees with larger trunks and greater heights possess more biomass, resulting in a higher capacity to sequester carbon compared to smaller trees.

### 2.4 Assessing Carbon in Trees

Assessing the amount of carbon in trees can be estimated by measuring the Diameter at Breast Height (DBH) and the tree height, then calculating the values using appropriate mathematical equations.

### 2.5 General Characteristics and Significance of Ivory Coast Almond Trees

The Ivory Coast Almond trees (Terminalia catappa trees)(Terminalia catappa trees)(*Terminalia ivorensis*) is a large perennial characterized by its wide-spreading canopy and layered leaf arrangement, which provides excellent shade. It is popularly planted in educational institutions, along roadsides, and in public spaces due to its strength, environmental resilience, and ability to enhance the landscape.

With its rapid growth and large trunk size, The Ivory Coast Almond trees (Terminalia catappa trees)(Terminalia catappa trees)has the potential for significant carbon sequestration. This gives it a vital role in reducing atmospheric carbon dioxide and mitigating the impacts of global warming.

**2.6 Related Research**

A review of related research reveals that studies on carbon sequestration in perennials and green spaces have been conducted in various areas. Most findings indicate that trees with larger trunk diameters and greater heights have a higher capacity for carbon sequestration than smaller trees. Furthermore, increasing green spaces in educational institutions and communities can help reduce greenhouse gases and create a better environment. However, research specifically regarding the carbon sequestration of Ivory Coast Almond Trees within school grounds remains limited. This study is therefore significant in filling this knowledge gap and can serve as a guideline for the appropriate management of green spaces in educational institutions.

# Chapter 3

# Research Methodology

The research titled "A Study of Carbon Sequestration in Ivory Coast Almond Trees within the Grounds of Varee Chiang Mai School" is a study aimed at estimating the carbon values of Ivory Coast Almond Trees. This process involves measuring tree dimensions to determine the trunk diameter and tree height, then utilizing the collected data to calculate the carbon sequestration values.

## 3.2 Population and Sample Scope

- **Population:** The population used in this research consists of 5 Ivory Coast Almond Trees located within the Varee Chiang Mai School area.
- **Sample:** The sample group consists of 5 Ivory Coast Almond Trees that are accessible and suitable for measurement, selected through Purposive Sampling.

## 3.3 Research Instruments

**Instruments for measuring tree circumference:**

1. Measuring tape
2. Pens and pencils
3. Data recording tables
4. Camera

**Instruments for measuring tree height:**

1. Measuring tape
2. Pens and pencils
3. Data recording tables
4. Camera
5. Clinometer (a tool for measuring tree height)

**Clinometer**

**How to Make:** A clinometer is a tool used for measuring angles of inclination.

1. Attach the clinometer template onto a piece of cardboard of the same size, covering both the front and back.
2. Punch a hole through the circle marked on the template and tie one end of a 15-centimeter-long string through it.
3. Tie a metal nut or a ring to the other end of the string. (Ensure the weight stays against the cardboard at all times, which will make it easier to read the angle).
4. Attach a plastic straw along the indicated line to be used as a sighting tube (viewing point).

**3.4 Data Collection**

The data collection process was conducted according to the following steps:

1. Survey The Ivory Coast Almond trees (Terminalia catappa trees) within the school area.
2. Measure the trunk circumference of The Ivory Coast Almond trees (Terminalia catappa trees) at breast height (approximately 1.30 meters above the ground).
3. Calculate the trunk diameter from the measured circumference.
4. Measure the height of the Ivory Coast Almond Trees.
5. Record the collected data in the data table.

**How to Measure Tree Height**

1. Stand upright at an appropriate distance from the tree being measured, ensuring you are on the same ground level as the tree.

2. Measure the horizontal distance from the base of the tree to the spot where you are standing.

3. Sight the top of the tree through the clinometer by looking through the straw. Allow the metal ring (weight) to hang freely in a vertical line until it settles, then carefully hold it against the clinometer.

4. Read the angle of elevation and record the value.

5. Convert the angle of elevation into a Tangent (tan) value by referring to a trigonometric table.

6. Calculate the height of the tree from the observer's eye level to the treetop using trigonometric calculations (Height = Distance × tan $\theta$).

7. Add the observer's height (from the ground to eye level) to the calculated tree height to get the total height of the tree.


A clinometer is a tool used for measuring angles of inclination


| Angle | Tan. | Angle | Tan. | Angle | Tan. | Angle | Tan. | Angle | Tan. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.02 | 17 | 0.31 | 33 | 0.65 | 49 | 1.15 | 65 | 2.14 |
| 2 | 0.03 | 18 | 0.32 | 34 | 0.67 | 50 | 1.19 | 66 | 2.25 |
| 3 | 0.05 | 19 | 0.34 | 35 | 0.70 | 51 | 1.23 | 67 | 2.36 |
| 4 | 0.07 | 20 | 0.36 | 36 | 0.73 | 52 | 1.28 | 68 | 2.48 |
| 5 | 0.09 | 21 | 0.38 | 37 | 0.75 | 53 | 1.33 | 69 | 2.61 |
| 6 | 0.11 | 22 | 0.40 | 38 | 0.78 | 54 | 1.38 | 70 | 2.75 |
| 7 | 0.12 | 23 | 0.42 | 39 | 0.81 | 55 | 1.43 | 71 | 2.90 |
| 8 | 0.14 | 24 | 0.45 | 40 | 0.84 | 56 | 1.48 | 72 | 3.08 |
| 9 | 0.16 | 25 | 0.47 | 41 | 0.87 | 57 | 1.54 | 73 | 3.27 |
| 10 | 0.18 | 26 | 0.49 | 42 | 0.90 | 58 | 1.60 | 74 | 3.49 |
| 11 | 0.19 | 27 | 0.51 | 43 | 0.93 | 59 | 1.66 | 75 | 3.73 |
| 12 | 0.21 | 28 | 0.53 | 44 | 0.97 | 60 | 1.73 | 76 | 4.01 |
| 13 | 0.23 | 29 | 0.55 | 45 | 1.00 | 61 | 1.80 | 77 | 4.33 |
| 14 | 0.25 | 30 | 0.58 | 46 | 1.04 | 62 | 1.88 | 78 | 4.70 |
| 15 | 0.27 | 31 | 0.60 | 47 | 1.07 | 63 | 1.96 | 79 | 5.14 |
| 16 | 0.29 | 32 | 0.62 | 48 | 1.11 | 64 | 2.05 | 80 | 5.67 |

Angle of Elevation and Tree Height Measurements

### 3.5 Carbon Calculation

The data for trunk diameter and height of The Ivory Coast Almond trees (Terminalia catappa trees)were used to calculate carbon values using a specific formula. The resulting carbon values are estimates intended to demonstrate the capacity of Ivory Coast Almond Trees to absorb carbon dioxide.

### 3.6 Data Analysis

The data were analyzed by comparing the carbon values of each individual Ivory Coast Almond Tree. The research findings are presented in the form of tables and illustrations for clear and easy understanding.

### 3.7 Statistics Used in the Research

The statistics and mathematical methods used include:

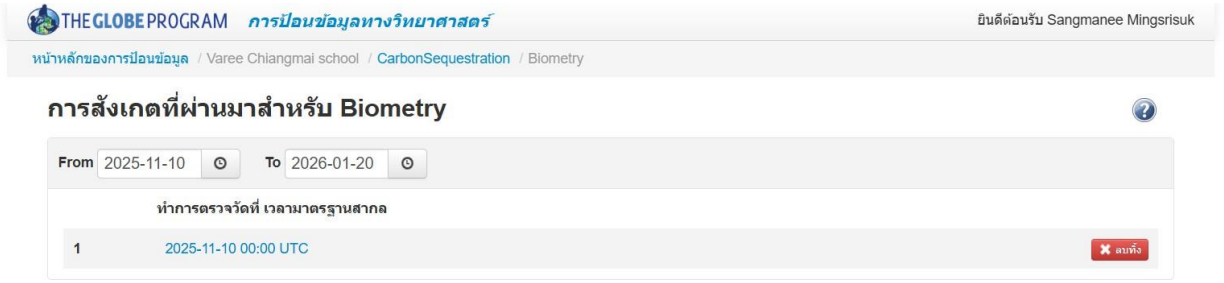
- Allometric Equations: These are formulas used for determining carbon sequestration values in trees.

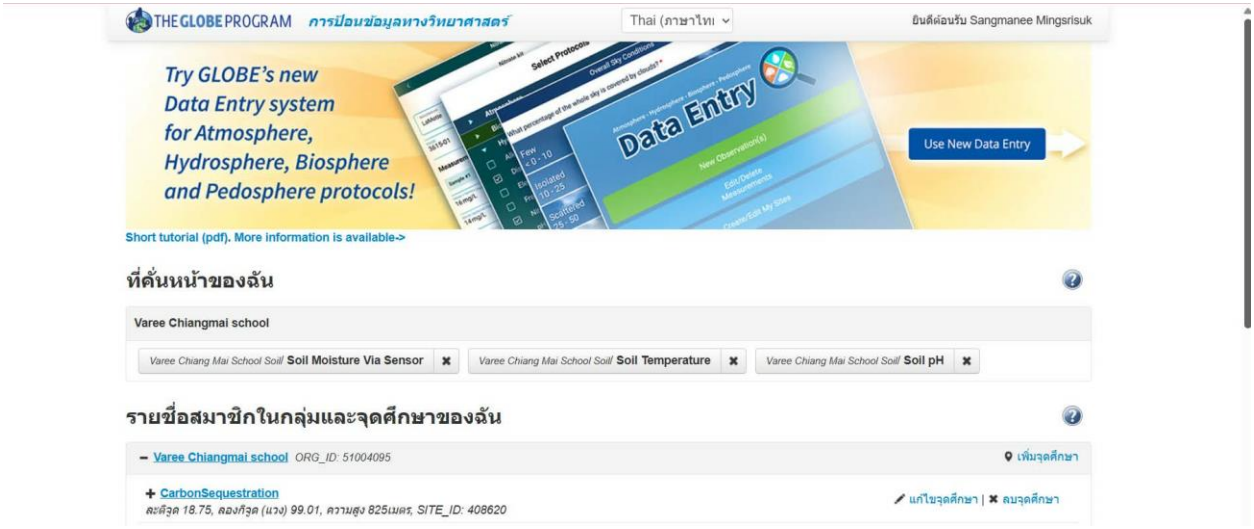
**Summary Table of Ivory Coast Almond Tree Heights**

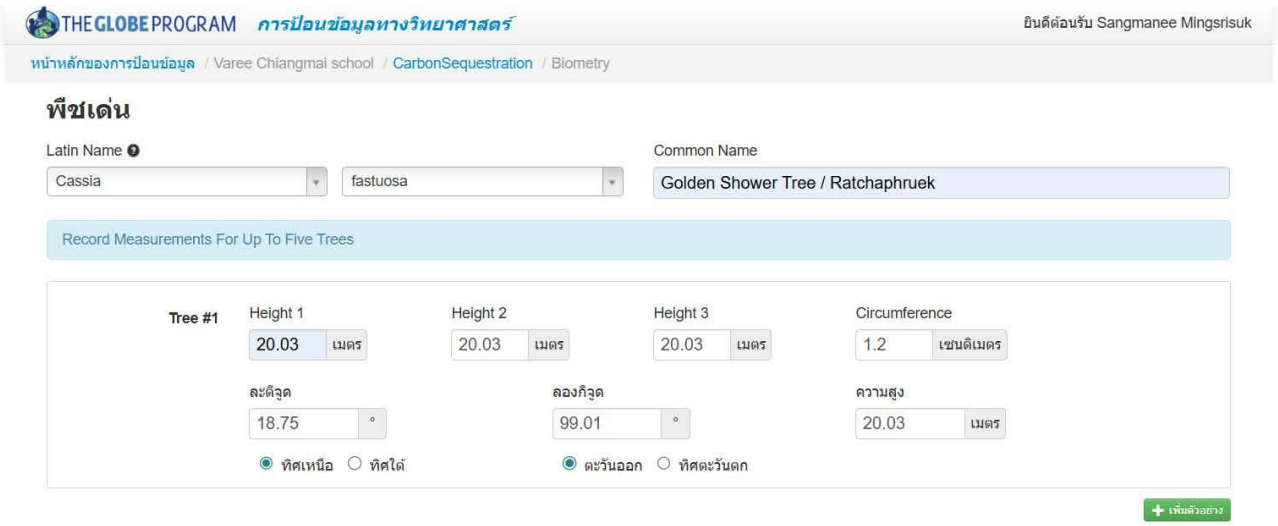
| Tree Number | Angle | Distance | Observer's Height | Tree Height |
|---|---|---|---|---|
| Tree No. 1 | 70 degree | 5 m. | 1.28 m. | 15.015 m. |
| Tree No. 2 | 75 degree | 6 m. | 1.27 m. | 23.66 m. |
| Tree No. 3 | 72 degree | 5.6 m. | 1.30 m. | 18.54 m. |
| Tree No. 4 | 72 degree | 4.8 m. | 1.30 m. | 16.074 m. |
| Tree No. 5 | 50 degree | 4.5 m. | 1.24 m. | 6.604 m. |

**Summary Table of Carbon Sequestration in Ivory Coast Almond Trees at Varee Chiang Mai School**

| Tree Number | Tree Height (m) | Circumference (cm) | Diameter (cm) | $CO_2$ Absorption (kg $CO_2$) |
|---|---|---|---|---|
| Tree No. 1 | 15.015 m. | 100 cm. | 50 cm. | 252.20 kg $CO_2$ |
| Tree No. 2 | 23.660 m. | 75 cm. | 37.5 cm. | 223.50 kg $CO_2$ |
| Tree No. 3 | 18.540 m. | 80.5 cm. | 40.25 cm. | 201.90 kg $CO_2$ |
| Tree No. 4 | 16.074 m. | 83 cm. | 41.5 cm. | 186.10 kg $CO_2$ |
| Tree No. 5 | 6.604 m. | 99 cm. | 49.5 cm. | 108.80 kg $CO_2$ |


THE GLOBE PROGRAM การป้อนข้อมูลทางวิทยาศาสตร์
ยินดีต้อนรับ Sangmanee Mingsrisuk
หน้าหลักของการป้อนข้อมูล / Varee Chiangmai school / CarbonSequestration / Biometry
การสังเกตที่ผ่านมาสำหรับ Biometry
From 2025-11-10
To 2026-01-20
ทำการตรวจวัดที่ เวลามาตรฐานสากล
1
2025-11-10 00:00 UTC
ลบทิ้ง


THE GLOBE PROGRAM การป้อนข้อมูลทางวิทยาศาสตร์
Thai (ภาษาไทย)
ยินดีต้อนรับ Sangmanee Mingsrisuk
Try GLOBE's new Data Entry system for Atmosphere, Hydrosphere, Biosphere and Pedosphere protocols!
Data Entry
Use New Data Entry
Short tutorial (pdf). More information is available->
ที่คั่นหน้าของฉัน
Varee Chiangmai school
Varee Chiang Mai School Soil/ Soil Moisture Via Sensor
Varee Chiang Mai School Soil/ Soil Temperature
Varee Chiang Mai School Soil/ Soil pH
รายชื่อสมาชิกในกลุ่มและจุดศึกษาของฉัน
Varee Chiangmai school ORG_ID: 51004095
เพิ่มจุดศึกษา
CarbonSequestration
ละติจูด 18.75, ลองกิจูด (แวง) 99.01, ความสูง 825เมตร, SITE_ID: 408620
แก้ไขจุดศึกษา | ลบจุดศึกษา


THE GLOBE PROGRAM การป้อนข้อมูลทางวิทยาศาสตร์
ยินดีต้อนรับ Sangmanee Mingsrisuk
หน้าหลักของการป้อนข้อมูล / Varee Chiangmai school / CarbonSequestration / Biometry
พืชเด่น
Latin Name
Cassia
fastuosa
Common Name
Golden Shower Tree / Ratchaphruek
Record Measurements For Up To Five Trees
Tree #1
Height 1
20.03 เมตร
Height 2
20.03 เมตร
Height 3
20.03 เมตร
Circumference
1.2 เซนติเมตร
ละติจูด
18.75 °
ทิศเหนือ ทิศใต้
ลองกิจูด
99.01 °
ตะวันออก ทิศตะวันตก
ความสูง
20.03 เมตร
เพิ่มตัวอย่าง

# Chapter 4

# Research Results

The research titled "A Study of Carbon Sequestration in Ivory Coast Almond Trees within the Grounds of Varee Chiang Mai School" aims to investigate the carbon sequestration capacity of Ivory Coast Almond Trees. This was achieved by measuring the trunk diameters and tree heights, followed by calculating the carbon values. The research results can be summarized as follows:

## 4.1 Results of the Study on Ivory Coast Almond Tree Heights

**Summary Table of Carbon Sequestration in Ivory Coast Almond Trees at Varee Chiang Mai School**

| Tree Number | Tree Height (m) | Circumference (cm) | Diameter (cm) | $CO_2$ Absorption (kg $CO_2$) |
|---|---|---|---|---|
| Tree No. 1 | 15.015 m. | 100 cm. | 50 cm. | 252.20 kg $CO_2$ |
| Tree No. 2 | 23.660 m. | 75 cm. | 37.5 cm. | 223.50 kg $CO_2$ |
| Tree No. 3 | 18.540 m. | 80.5 cm. | 40.25 cm. | 201.90 kg $CO_2$ |
| Tree No. 4 | 16.074 m. | 83 cm. | 41.5 cm. | 186.10 kg $CO_2$ |
| Tree No. 5 | 6.604 m. | 99 cm. | 49.5 cm. | 108.80 kg $CO_2$ |

From the height measurements, it was found that each Ivory Coast Almond Tree has a clearly different height.

The tallest tree is Tree No. 2, with a height of 23.66 meters. This is followed by Tree No. 3 at 18.54 meters and Tree No. 4 at 16.07 meters. The tree with the lowest height is Tree No. 5, standing at only 6.60 meters.

These variations in height reflect the age of the trees and the environmental conditions in which each tree has grown.

### 4.2 **Results of Carbon Sequestration Study**

Based on the calculation of carbon values from tree height and trunk diameter, the findings are as follows:

- **Ivory Coast Almond Tree No. 1** sequestered the highest amount of carbon at 252.20 kg $CO_2$.
- **Ivory Coast Almond Tree No. 2** followed with 223.50 kg $CO_2$.
- **Ivory Coast Almond Trees No. 3 and 4** sequestered carbon at a moderate level.
- **Ivory Coast Almond Tree No. 5**, which is the smallest in size, sequestered the least amount of carbon at 108.80 kg $CO_2$.

### 4.3 Comparison of Carbon Values in Ivory Coast Almond Trees

By comparing the carbon values of all five Ivory Coast Almond Trees, it was found that trees with greater height and larger trunk diameters possess a higher carbon sequestration capacity than smaller trees. This clearly demonstrates that the size and growth rate of a tree are directly correlated with its carbon sequestration potential.

### 4.4 Overall Research Conclusion

The research results conclude that The Ivory Coast Almond trees (Terminalia catappa trees)within the grounds of Varee Chiang Mai School have varying capacities for carbon sequestration. These trees play a vital role in absorbing carbon dioxide, a primary greenhouse gas, thereby helping to mitigate global warming and promote a healthier environment within the school.

# Chapter 5

# Conclusion and Discussion

## 5.1 Research Conclusion

The research titled "A Study of Carbon Sequestration in Ivory Coast Almond Trees within the Grounds of Varee Chiang Mai School" aimed to investigate the carbon sequestration capacity of Ivory Coast Almond Trees. This was conducted by measuring the trunk diameter and tree height of five sample trees to calculate their respective carbon values.

The findings revealed that each Ivory Coast Almond Tree possessed different heights and trunk diameters, resulting in varying levels of carbon sequestration. Trees with larger sizes and greater heights demonstrated a higher capacity for carbon storage compared to smaller trees. The tree with the highest carbon value was found to sequester up to **252.20 kilograms of carbon dioxide ($CO_2$).**

In conclusion, the study indicates that The Ivory Coast Almond trees (Terminalia catappa trees)(Terminalia catappa trees)is a perennial species with significant potential for absorbing carbon dioxide. It plays a crucial role in mitigating global warming and enhancing the environmental quality within the school.

## 5.2 Discussion of Results

The research results indicate that the carbon sequestration capacity of Ivory Coast Almond Trees is directly related to the tree's size, particularly its height and trunk diameter. Well-grown trees accumulate more biomass, which leads to higher carbon sequestration levels. These findings are consistent with environmental principles stating that large perennials play a vital role in absorbing greenhouse gases.

Furthermore, the variations in carbon values among the individual trees may be attributed to differences in age, soil conditions, sunlight exposure, and the surrounding environment. This study demonstrates that planting and maintaining trees in educational institutions not only provides shade and beauty but also helps reduce atmospheric carbon dioxide and fosters environmental conservation awareness among students.

### 5.3 Recommendations

Recommendations Based on Research:

1. **Promotion of Tree Planting:** The school should encourage the planting of more perennial trees, particularly Ivory Coast Almond Trees or other species with high carbon sequestration potential.
2. **Maintenance for Efficiency:** Existing trees should be properly maintained to ensure healthy growth, which will increase their overall efficiency in sequestering carbon
3. **Educational Integration:** The research findings should be utilized as an educational resource to raise awareness about the environment and global warming within the school.

## References


1. Makpun, V., Rubsaitong, J., & Sae-arli, S. (2018). Carbon Stock of Trees in Nakhon Si Thammarat Rajabhat University. *Srinakharinwirot University Journal (Science and Technology)*, 10(20), 119–128. Thai Journal Online.
2. (Author). (2023). *Carbon Dioxide Absorption and Carbon Sequestration of Trees in Santiphap Park, Bangkok*. (Research Report). Kasetsart University Knowledge Repository (kukr.lib.ku.ac.th).
3. (Author). (2023). *Carbon Sequestration of Trees in Public Parks within Tak City Municipality, Tak Province*. (Research Report). Kasetsart University Knowledge Repository (kukr.lib.ku.ac.th).
4. (Author). (2025). Species Diversity and Carbon Sequestration of Trees in Restored Hill Evergreen Forest under the Permanent Forest Cultivation Project in Honor of the King, Plantation Plot 9/2, Mae Hong Son. *Thai Journal of Forestry*. ThaiJo.
5. (Author). (2025). Biomass and Carbon Sequestration of Trees in the Plant Genetic Conservation and Wildlife Reintroduction Project Area, Kalasin University. *Journal of Research Unit on Science, Technology and Environment for Learning*. ejournals.swu.ac.th.
6. Sukwong, S. (2010). *Assessment of Carbon Sequestration Potential in Biomass of Perennials in Urban Forest Areas*.
7. Charoendee, S., et al. (2017). *A Study on Carbon Sequestration Potential of Urban Perennial Trees in Chiang Mai Province*.

# Appendix

## Appendix A

## Research Data Tables

**Summary Table of Ivory Coast Almond Tree Heights**

| Tree Number | Angle | Distance | Observer's Height | Tree Height |
|---|---|---|---|---|
| Tree No. 1 | 70 degree | 5 m. | 1.28 m. | 15.015 m. |
| Tree No. 2 | 75 degree | 6 m. | 1.27 m. | 23.66 m. |
| Tree No. 3 | 72 degree | 5.6 m. | 1.30 m. | 18.54 m. |
| Tree No. 4 | 72 degree | 4.8 m. | 1.30 m. | 16.074 m. |
| Tree No. 5 | 50 degree | 4.5 m. | 1.24 m. | 6.604 m. |

**Summary Table of Carbon Sequestration in Ivory Coast Almond Trees at Varee Chiang Mai School**

| Tree Number | Tree Height (m) | Circumference (cm) | Diameter (cm) | $CO_2$ Absorption (kg $CO_2$) |
|---|---|---|---|---|
| Tree No. 1 | 15.015 m. | 100 cm. | 50 cm. | 252.20 kg $CO_2$ |
| Tree No. 2 | 23.660 m. | 75 cm. | 37.5 cm. | 223.50 kg $CO_2$ |
| Tree No. 3 | 18.540 m. | 80.5 cm. | 40.25 cm. | 201.90 kg $CO_2$ |
| Tree No. 4 | 16.074 m. | 83 cm. | 41.5 cm. | 186.10 kg $CO_2$ |
| Tree No. 5 | 6.604 m. | 99 cm. | 49.5 cm. | 108.80 kg $CO_2$ |

## Appendix B

## Research Illustrations

**Figure 1: The Ivory Coast Almond trees within Varee Chiang Mai School**


**Tree No. 1**


**Tree No. 2**



**Tree No. 3**


**Tree No. 4**

**Tree No. 5**

**Figure 2: Determining the height of Ivory Coast Almond Trees**

**Figure 2: Determining the height of Ivory Coast Almond Trees**

**Figure 2: Determining the height of Ivory Coast Almond Trees**

**Figure 3: Students measuring their height**

**Figure 4: Measuring the circumference of Ivory Coast Almond Trees**

**Figure 4: Measuring the circumference of Ivory Coast Almond Trees**