Research Title : A Comparative Study of Carbon Storage Capacity of Coconut and Longkong Trees

Research Panel : Mr. Tanakorn Rakru

Ms. Warisa Tengrang

Ms. Nattakun Sensulee

Grade Level : Secondary 5

Advisor : Mrs.Kwanjai Karnjanasrimak, Ms. Naeriya Tonkrongchan , Ms.Chularat Singkaew

Schools : Wichienmatu School, Trang Province

Scientists: Dr. Apirak Songrak

Abstract

Environmental science research study

A comparative study of carbon sequestration capacity between coconut and longkong trees at Ban Thung Sam Ko, Laem Som Subdistrict, Palian District, Trang Province aimed to investigate the ability of longkong and coconut trees to absorb and store carbon from the atmosphere. The results showed that longkong trees store more carbon than coconut trees.

Keywords

Coconut trees, longkong trees, carbon sequestration.

Introduction

Currently, we are facing increasing problems of global warming and greenhouse gases, resulting from human activities such as deforestation and the burning of fossil fuels. This leads to a continuous increase in carbon dioxide levels, negatively impacting the industrial and other sectors. In the field of agriculture, the research team recognized this problem and therefore sought to utilize the carbon dioxide generated to its fullest potential. This led to a study comparing the carbon sequestration capacity of coconut trees (Cocos nucifera L. var. nucifera) and longkong trees (Lansium domesticum Corres). Because coconut trees have a single trunk, no branches, and scars from fallen leaves along the trunk, their age can be calculated from these scars. Longkong trees are 20-30 meters tall, with a round, upright trunk that doesn't branch. The bark is hard, gray, and rough. Longkong trees are medium to large trees, 10-15 meters tall, with a canopy size of 6-10 meters. They are evergreen with a wide, dense and conical canopy. The bark is light brown, relatively smooth, or sometimes with small flakes. Therefore, coconut and longkong trees are commonly found around villagers' homes because they are easy to grow, produce good yields, grow quickly, and efficiently store carbon in their wood.

Objective

To compare longkong trees with coconut trees, they have a greater ability to absorb and store carbonfrom the atmosphere.

Scope of study

A comparative study of carbon sequestration by coconut and longkong trees at Ban Thung Sam Ko, Tambon Laem Som, Amphoe Palian, Trang Province.

Research question

Do coconut trees and longkong trees have different carbon storage capacities, and if so, how?

Research Hypothesis

Longkong trees have a greater ability to store carbon than coconut trees.

Materials and equipment and methods for conducting research

1.Measuring tape

2. Tape measure

3.Clinometer

4. Google Map

5.Website for assessing tree carbon sequestration.

6.Camera

Principles of inspection

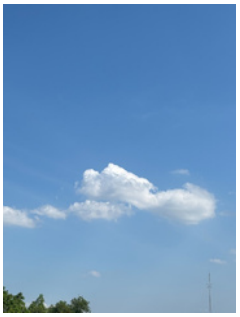
GLOB's measurement methodology

Measure carbon storage

Set study points

A comparative study of carbon sequestration by coconut and longkong trees at Ban Thung Sam Ko, Laem Subdistrict. Som, Palian District, Trang Province Located at latitude 7.32915° and longitude 99.77111°.

Picture of 6 directions



Research methods

1. Research preparation steps

Step 1: Count the number of coconut and longkong trees at Ban Thung Sam Ko, Laem Som Subdistrict, Palian District, Trang Province.

Step 2: Measure 1.30 meters above the ground and then measure the circumference of the tree to study.

Step 3: Measure the distance from the tree to the point where the person measuring can see the top of the tree.

Step 4: Use a clinometer to measure the angle observed from the observer's eye level to the summit in order to calculate the tangent.

Step 5: Calculate the total carbon content in the biomass using a tree carbon sequestration assessment website, based on the tree's circumference and height.

The table shows the amount of carbon stored by Longkong trees

Longkong	Survey results		
Study point	height	circumference	Carbon content
Tree number 1	8.71 m.	110 cm.	169.56 kgC
Tree number 2	7.41 m.	63 cm.	50.70 kgC
Tree number 3	8.398 m.	106 cm.	152.73 kgC
Tree number 4	7.50 m.	46 cm.	28.27 kgC
Tree number 5	7.825 m.	85 cm.	94.10 kgC
average			99.078

The table shows the amount of carbon stored by coconut trees

coconut tree	Survey results		
Study point	height	circumference	Carbon content
Tree number 1	17.729 m.	90 cm.	94.30 kgC
Tree number 2	17.788 m.	103 cm.	94.56 kgC
Tree number 3	18.082 m.	94 cm.	95.52 kgC
Tree number 4	18.999 m.	90 cm.	99.74 kgC
Tree number 5	18.082 m.	91 cm.	95.83 kgC
average			95.99

Study results and discussion

Studies on carbon sequestration in coconut and longkong trees have shown that longkong trees sequester more carbon than coconut trees. This is due to their greater height and circumference to affect carbon storage capacity. Therefore, longkong trees have a higher potential to absorb carbon dioxide from the atmosphere and mitigate global warming than coconut trees.

Acknowledgments

This environmental research project, "A Comparative Study of Carbon Sequestration in Coconut and Longkong Trees at Ban Thung Sam Ko, Laem Som Subdistrict, Palian District, Trang Province," would like to express its gratitude to Ban Thung Sam Ko, Laem Som Subdistrict, Palian District, Trang Province for providing knowledge and the location for data collection to Mr. Sakda Paisomboon, Director of Wichianmatu School for his support and assistance; to Mrs. Kwanjai Kanjanasrimek,Ms. Naeriya Tonkrongchan,Ms.Chularat Singkaew, our environmental research advisor, for her guidance and information and to all the teachers in the Science and Technology learning group at Wichienmatu School for their care and guidance. Finally, we thank our friends for their assistance in this environmental research.

Reference documents

Documents for calculating the amount of carbon

Source: https://eng.forest.ku.ac.th/project/carbon/ Accessed January 18, 2026.

Characteristics of the coconut tree; Plant Genetic Conservation Project.

Source: https://www.rspg.or.th/plants_data/herbs/herbs_10_6.htm

Accessed on January 19, 2026.

Characteristics of the Longan Tree, Horticultural Research Institute.

Source: https://www.doa.go.th/hort/?page_id=52325 Accessed January 19, 2026.

Measuring carbon sequestration: Green World Institute.

Source: https://www.doa.go.th/hort/?page_id=52325 Accessed January 20, 2026