Research Report

Title: The Study of Water Quality in Oil Palm Plantation Areas, Bavee Subdistrict, Hat Samran District, Trang Province.

Research Team

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Abstract

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The study on the water quality of in in Oil Palm Plantation Areas, Bavee Subdistrict, Hat Samran District, Trang Province., was conducted between January and February 2025. The objective was to assess the water quality in this area by measuring key parameters such as dissolved oxygen, temperature, water transparency, and pH levels.The results revealed that the average pH level of the water was 7, the dissolved oxygen level was 6.33 mg/L, and the average water temperature was 21.67°C. The average water transparency depth was 15.67 cm. Based on these findings, the water quality was deemed suitable for the survival of aquatic plants.

Keywords: Water quality

Introduction

Water is a natural resource that is an essential component of all living organisms, including plants, animals, and humans. Every living being requires water for survival, with humans especially needing clean water for consumption and use. Without sufficient water or if the water is contaminated, humans cannot survive. The water on Earth is primarily saltwater, making up 97.3%, while freshwater used by humans constitutes only 2.7%. This freshwater is divided into surface water, which accounts for only 1%, groundwater which accounts for 21%, and water in the air and soil, which cannot be directly utilized, making up 88%. Therefore, utilizing water resources requires proper planning and management, while also considering the water quality.

The area of Had Samran Subdistrict in Trang Province consists of various terrains, including plains, hills, canals, and mangrove forests. Currently, water resource use in this area faces issues, such as water pollution and contamination. Since all living organisms depend on water for survival, the researchers aim to study the quality of water to understand the changes in water, such as oxygen levels, temperature, transparency, and pH levels. This data will contribute to improving water quality, ecosystem health, and the growth of plants in the area.

Research Objective

To study the water quality in the palm plantation area of Ban Hwi Subdistrict, Had Samran District, Trang Province.

Research Question

1.What is the water quality in the palm plantation area of Ban Hwi, Had Samran District, Trang Province?

Hypothesis

The water quality in the palm plantation area of Ban Hwi, Had Samran District, Trang Province differs.

Materials, Equipment, and Research Methodology

1. Thermometer

2. Litmus Paper

3. Tape Measure

4. Monitor Dissolved Oxygen Test Kit

GLOBE Methodology

Hydrosphere Water Quality Measurement Methodology

Study Area Definition

This study was conducted in Had Samran District, Trang Province. Field visits were made to collect water samples for water quality measurements. Water samples were taken from natural water sources that were the subject of the study, at a depth of 10 centimeters. The specific location of the study site is as follows Latitude (N) 7.285988 Longitude (E) 99.611030

Research Procedure

1. Preparation Stage

1) Define the research topic and select the area of study.

2) Conduct a literature review and gather relevant information related to the study.

3) Establish the research objectives.

4) Determine the study site and identify the locations where water samples will be collected within the study area.

2. Implementation Stage

1) Plan the work to be done.

2) Survey the area where the research will be conducted.

3) Measure the water quality according to the GLOBE methodology as follows:

Define the sample collection points, which are natural water sources in Had Samran District, Trang Province.

Measuring Dissolved Oxygen in Water using the Monitor Test Kit

1) Collect water samples in a test tube.
2) Add 2 drops of Reagent 1 to the test tube containing the water sample.
3) Add 2 drops of Reagent 2 and close the test tube lid tightly to avoid air bubbles.
4) Shake the test tube to create a yellow-brown precipitate.
5) Wait for the precipitate to settle to half of the test tube.
6) Open the lid, add 5 drops of Reagent 3, then close the test tube lid again, ensuring no air bubbles.
7) Shake the test tube and wait for the precipitate to dissolve completely, turning the solution yellow.
8) Pour the solution from Step 7 into a new test tube to reach the 5 ml mark.
9) Add Reagent 4, then shake and count the number of drops
10) When the yellow color begins to fade, add 2 drops of Reagent 5, and the solution should turn blue.
11) Count the number of drops, then add more Reagent 4 and shake until the solution shows no color.
12) Record the number of drops used and calculate the dissolved oxygen level in the water.
13) Repeat the process two more times and record the results.

Measuring pH of Water using Litmus Paper

1) Select the location where the pH of the water will be measured.
2) Collect a water sample for testing.
3) Dip the litmus paper into the water sample to be tested.
4) Wait for the litmus paper to change color, then read the pH value.
5) Repeat the process two more times and record the results

Measuring Water Temperature using a Thermometer

1) Select the location where the water temperature will be measured.
2) Collect a water sample for testing.
3) Immerse the thermometer into the water and wait for it to stabilize.
4) Read the temperature and record the result.
5) Repeat the process two more times and record the results.

Measuring Water Depth

1) Select the location where the water depth will be measured.
2) Use a tape measure to measure the water depth by immersing it into the water.
3) Read the value obtained and record the result.
4) Repeat the process two more times and record the results.

Research Results

The geographic coordinates for the study of water quality from natural sources in Had Samran District, Trang Province are: Latitude(N) 7.285988 Longitude(E) 99.611030

Table 1: Geographic Coordinates of the Study Site

Study Site	The geographic coordinates	
	Latitude(N)	Longitude(E)
Natural Water Source in Had Samran District	7.285988	99.611030

Table 2: Dissolved Oxygen (DO) Levels

Water Quality Index	Unit	Sample Collection Round			Average Value
		Round 1	Round 2	Round 3	
Dissolved Oxygen (DO)	mg/l	6	7	6	6.33

From Table 2, it can be seen that the dissolved oxygen (DO) levels were highest in Round 2, with a value of 7 mg/l. Rounds 2 and 3 both showed a DO level of 6 mg/l. The average dissolved oxygen level was 6.33 mg/l.

Table 3: Acidity-Base (pH) Levels

Water Quality Index	Unit	Sample Collection Round			Average Value
		Round 1	Round 2	Round 3	
Acidity-Base (pH)	-	7	7	7	7

From Table 3, the pH levels of the water were consistent across all collection points, with a value of 7 in each round. The average pH value is 7, indicating that the water is neutral.

Table 4: Water Temperature

Water Quality Index	Unit	Sample Collection Round			Average Value
		Round 1	Round 2	Round 3	
Temperature	Celsius (°C)	22	21	22	21.67

From Table 4, the water temperature was highest at 22°C in both Round 1 and Round 2, with Round 3 showing a slightly lower value of 21°C. The average water temperature was 21.67°C.

Table 5: Water Transparency

Water Quality Index	Unit	Sample Collection Round			Average Value
		Round 1	Round 2	Round 3	
Water Transparency	Centimeters (cm)	15	16	16	15.67

From Table 5, the water transparency was the highest in Round 2 and Round 3, both with a value of 16 cm. Round 1 showed a lower transparency value of 15 cm. The average water transparency was 15.67 cm.

Summary of the Experiment

From the study, it was found that the water from natural sources had the following characteristics:

- The average pH of the water was 7, indicating neutral water.
- The dissolved oxygen (DO) level was 6.33 mg/l.
- The average water temperature was 21.67°C.
- The average transparency of the water was 15.67 cm.

These water quality values are suitable for the growth of plants, such as sweet taro (main plant), water spinach (secondary plant), and vetiver grass (partially).

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Authors

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