

## Layout of Environmental Science Research Report

**Title:** Research proposal on Relationship between Water Quality and the Growth of Lotus in Lotus Ponds.

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### Abstract

Environmental Science Research a study on the relationship between water quality and the growth of lotus in a pond with chicken manure and cow manure at Wichienmatu School. (1) Comparison of water quality in the lotus pond filled with chicken manure and cow manure. (2) Comparison of the growth of lotus in the pond of the lotus pond filled with chicken manure and cow manure. (3) The relationship between water quality and the growth of lotus in the lotus pond was supplemented with chicken manure and cow manure. It was found that the water temperature Acidity Base of Water The dissolved oxygen content in the water and the height of the lotus tree. In the lotus pond filled with chicken manure and cow manure at Wichienmatu School. There are differences and it was found that the pond filled with cow dung has a water temperature value. Acidity Base of Water Dissolved oxygen content in water The turbidity of the water and the height of the lotus tree are higher than the pond filled with chicken droppings.

**Keywords :** Water Quality Lotus Milk, Cow Manure, Chicken Manure

## **Origin and significance**

Nowadays, it is widely popular to grow lotus as a plant that grows in river basins. It is found in many areas of Thailand. It is commonly grown for beauty. In addition, there is currently a lot of animal manure waste from livestock farming. Therefore, the organizers have researched the cultivation of lotus colors in the lotus pond filled with cow dung and the lotus pond with chicken manure. To study the water quality in the lotus pond filled with chicken manure and cow manure, to study the growth of lotus in the lotus pond filled with cow manure and the lotus pond filled with chicken manure, and to study the relationship between water quality and the growth of lotus ponds in the lotus pond filled with cow manure and chicken manure. Therefore, the organizers conducted a study on the relationship between water quality and the growth of lotus in the lotus pond filled with chicken manure and cow manure at Wichienmatu School.

## **Research Questions**

1. Water quality in the lotus pond filled with chicken manure and cow manure at Wichienmatu School Is there a difference? How?
2. Is there a difference between the growth of lotus in the pond where chicken manure is filled with chicken manure and cow manure at Wichienmatu School?
3. Is there a difference between water quality and the growth of lotus in the pond where chicken manure is added with chicken manure and cow manure at Wichienmatu School?

## **Research Hypothesis**

1. There is a difference in the water quality in the lotus pond filled with chicken manure and cow manure in Wichienmatu School.

Early variant: Colored lotus pond filled with chicken manure and cow manure.

Variants based on : Water Quality

Control Variables : Environmental Measurement

2. There is a difference in the growth of lotus in the pond where chicken manure is filled with cow manure at Wichienmatu School.

Early variant: Colored lotus pond filled with chicken manure and cow manure.

Variable based on : Growth of the color lotus

Control Variables : Environmental Measurement

3. The relationship between water quality and the growth of lotus in the lotus pond filled with chicken manure and cow manure at Wichienmatu School is different.

Early variant: Colored lotus pond filled with chicken manure and cow manure.

Variable based on : Relationship of water quality with the growth of color lotus

Control Variables : Environmental Measurement

### Study Area



Picture 1 shows the lotus pond with cow manure. Picture 2 shows the lotus pond with chicken manure.

This research was conducted at Wichienmatu School, Mueang Trang District, Khok Lo Sub-district, Trang Province. located on the coordinates.

Latitude 7.5032371 degrees north Longitude: 99.6293169

## **Materials and equipment for conducting research**

### **1. Materials and equipment**

- 1.1 Dissolved Oxygen (DO) Dissolved Oxygen Test Kit
- 1.2 Thermometer
- 1.3 Universal indicator
- 1.4 Turbidity tube
- 1.5 Beaker
- 1.6 Tape Measure
- 1.7 cow manure;
- 1.8 Chicken droppings

### **2. How to conduct research**

#### **2.1 Water Quality Data Collection**

Perform methodological measurements of water quality. GLOBE By studying the measurement of water temperature. Acidity of the base of water, transparency of water. The amount of dissolved oxygen in water is as follows:

1. Measure the temperature of the water by immersing the thermometer in water about 10 centimeters deep for about 3 - 5 minutes. The thermometer bulb must remain in the water. Dip the thermometer for 1 minute for the 2nd and 3rd measurements by changing the thermometer reader to read the temperature. Units in degrees Celsius Perform a total of 3 measurements.

2. Measure the acidity of the water by washing the water sample bottle 3 times, collecting water samples near the point where the water temperature is measured, dipped the universal indicator strip into the water sample for 1-2 seconds, waited for the color to change, compared it with the standard color band, and then read the pH value. 3 Repeats

3. Measure the transparency of the water by rinsing the tank to be used with the sample water to be measured, then using the bucket to scoop up the water by trying to scoop it up at the surface of the water. Gently pour the lead into the water transparency tube, then observe on the bottom of the tube to see if you can still see black and white on the plate at the bottom of the tube. If black and white are still visible on the plate at the bottom of the tube, slowly pour in more water until the black and white on the plate on the bottom of the tube is not visible. While pouring water, slowly rotate the tube. To notice if black and white are still visible on the plate at the bottom of the tube. Read the water transparency in centimeters.

4. Measure the amount of dissolved oxygen in the water by rinsing the sample bottle with sample water. 3 Before collecting the sample, immerse the sample collection bottle under water by filling it up and close the lid under water. If you try to turn the bottle upside down, if a gas bubble occurs, pour out the water and start collecting a new water sample again. 2 Hours Perform All Inspections 3 The mean value should be in the range specified by the test set.

## **2.2 Collecting data on the growth of colored lotus**

Collect data on the growth of the lotus by studying the measurement of the height of the lotus tree. As follows:

1. Measure the height of the lotus tree using a tape measure to measure the distance between the soil surface and the base of the lotus tree. Read the height of the lotus tree. Data Collected 3 Times

## **2.3 Data analysis**

1. Water Temperature Analysis Acidity-base value of water The turbidity of water and the dissolved oxygen content value were calculated using the mean and standard deviation.

2. Analyze the growth of the color lotus Height value of the lotus tree using the mean value and standard deviation.

### findings

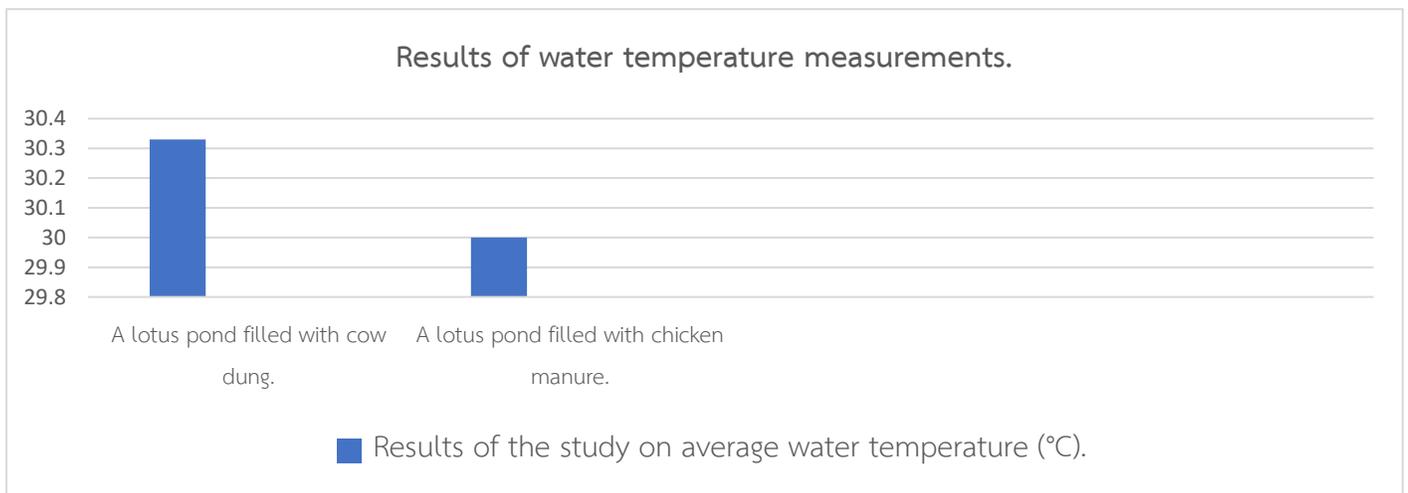
According to a study on the relationship between water quality and the growth of lotus in a lotus pond filled with chicken manure and cow manure at Wichienmatu School. The results of the study are as follows:

#### 1. Water Temperature Measurement Study

**Table 1** shows the comparison of water temperature between the water in the lotus pond with cow manure and the lotus pond with chicken manure.

No.	Cow manure (°C)	Chicken droppings (°C)
1	32	33
2	30	29
3	29	28
Average	30.33	30

The results of the study compared the average water temperature between the water in the lotus pond with cow manure and the lotus pond with chicken manure.

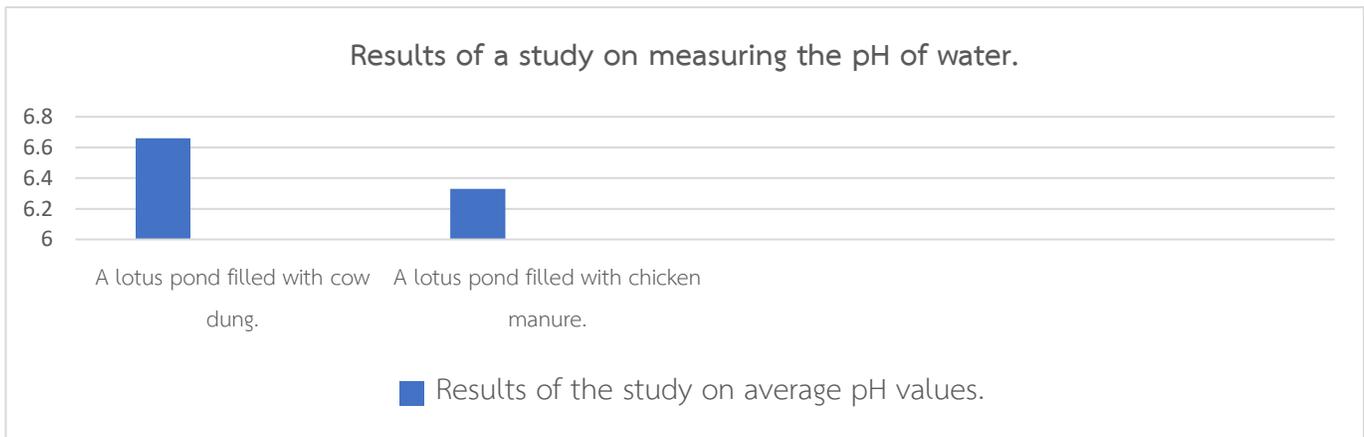


#### 2. Study on the measurement of the acidity base of water

Table 2 shows the comparison of the water base acidity between the water in the lotus pond with cow manure and the water in the lotus pond with chicken manure.

No.	Colored lotus pond with cow dung (pH)	Colored lotus pond with chicken droppings (pH)
1	7	6
2	6	7
3	7	6
Average	6.66	6.33

Results of a study comparing the average acidity base value of water between the water in the lotus pond with cow dung and colored lotus pond with chicken droppings.

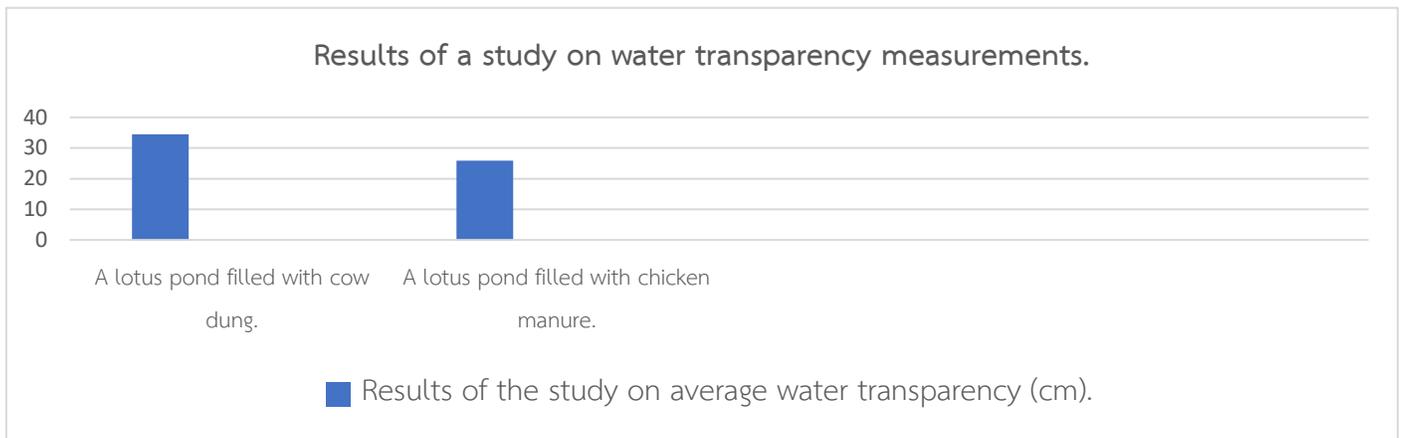


### 3. Water Transparency Measurement Study

Table 3 shows the comparison of the transparency value of the water in the lotus pond with cow manure and the lotus pond with chicken manure.

No.	Colored lotus pond with cow dung (cm)	Colored lotus pond with chicken droppings (cm)
1	32.4	23.3
2	34.5	28.7
3	36.6	25.5
Average	34.5	25.83

The results of the study compared the average transparency value of water between the water in the lotus pond with cow dung and Colored lotus pond with chicken droppings.



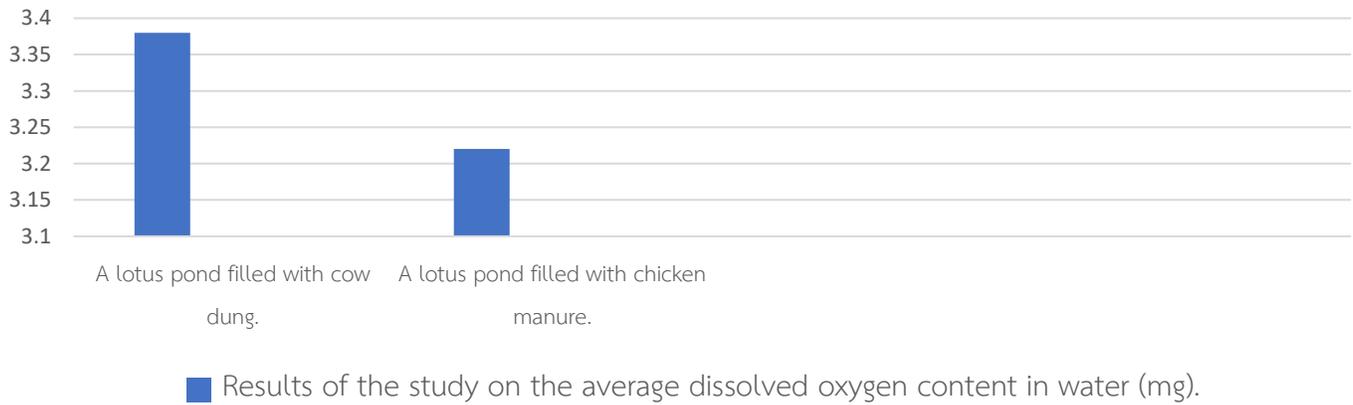
#### 4. Study of dissolved oxygen content measurement

**Table 4** shows the comparison of the amount of dissolved oxygen in the water in the lotus pond with cow manure and the lotus pond with chicken manure.

No.	Round	Colored lotus pond with cow dung (mg)	Colored lotus pond with chicken droppings (mg)
1	1	3.5	2.5
	2	3.0	3.5
	3	3.0	2.5
2	1	3.0	3.0
	2	3.5	2.5
	3	3.0	3.5
3	1	4.0	4.5
	2	3.5	4.0
	3	4.0	3.0
Average		3.38	3.22

Results of a study by comparing the dissolved oxygen content in the water between the water in the lotus pond with cow manure and the water lotus pond with chicken manure.

The results of a study measuring the amount of dissolved oxygen in water.



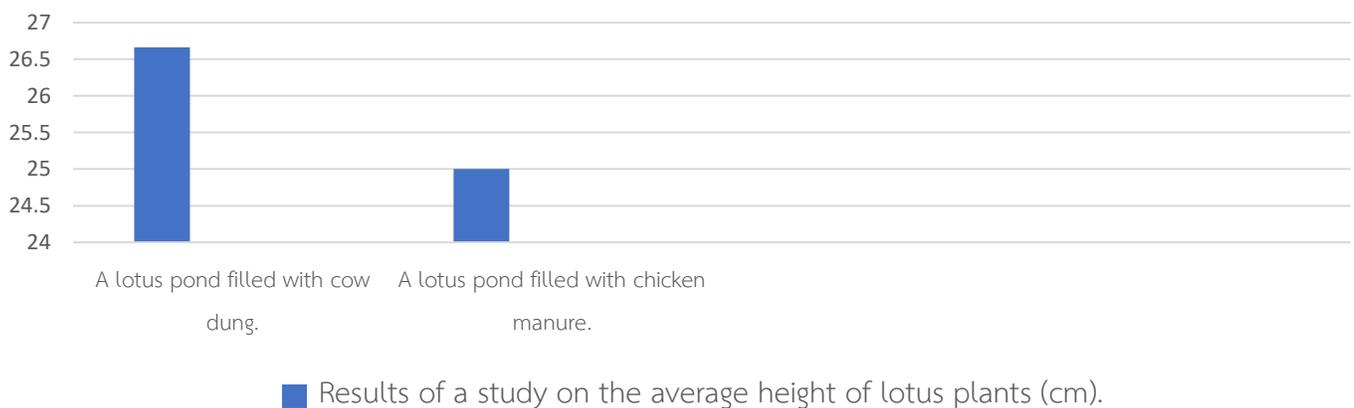
5. Study on the measurement of the height of the lotus tree

Table 5 shows the comparison of the height of the lotus pond in the lotus pond with cow manure and the lotus pond with chicken manure.

No.	Colored lotus pond with cow dung (cm)	Colored lotus pond with chicken droppings (cm)
1	23	20
2	28	26
3	29	29
Average	26.66	25

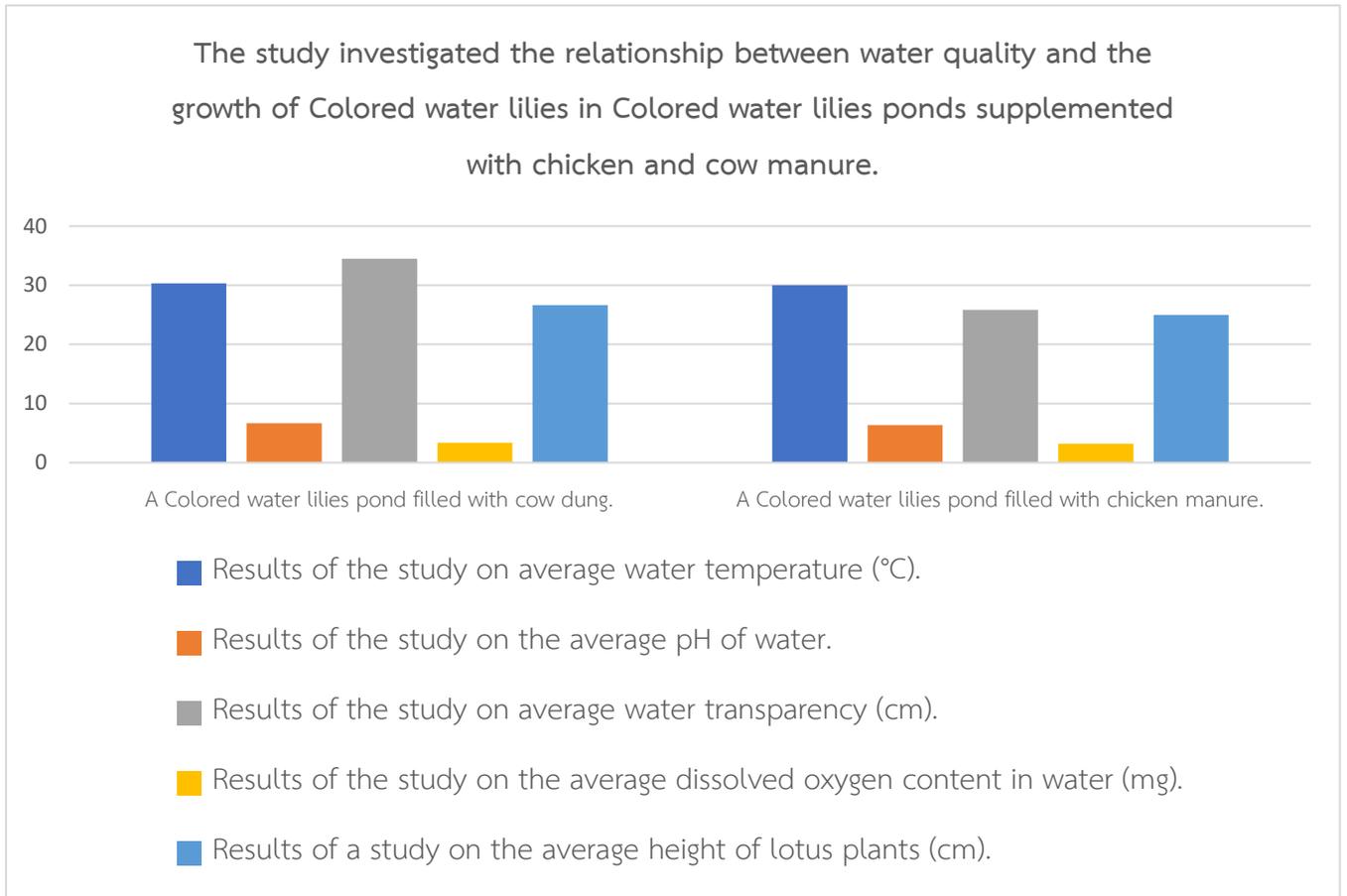
Results of a study comparing the height of the lotus tree between the lotus tree in the lotus pond with cow dung and Colored lotus pond with chicken droppings.

Results of a study on the height of lotus plants.



## 6. Study on the relationship between water quality and the growth of lotus in the pond of the lotus pond filled with chicken manure and cow manure.

The results of the study on the relationship between water quality and the growth of color lotus in the color lotus pond filled with chicken manure and cow manure.



### Summary and discussion

According to a study on the relationship between water quality and the growth of lotus in the pond filled with chicken manure and cow manure at Wichienmatu School, it was found that the pond filled with cow manure had a water temperature value. Acidity Base of Water for the amount of dissolved oxygen in the water, the turbidity of the water, and the height of the lotus tree are higher than the pond filled with chicken droppings.

## Acknowledgments

Conducting environmental research on "the study on the relationship between water quality and the growth of lotus in the lotus pond filled with chicken manure and cow manure at Wichienmatu School" was successfully completed. The organizer would like to thank Dr. Apirak Songrak, Rajamangala University of Technology Srivichai, Trang Campus. Knowledge about water quality measurement Collecting data on the growth of the color lotus Thank you. Mrs. Kwanjai Kanchansrimek, who helped to provide the equipment for the measurement and was a consultant, gave advice on the preparation and provided information on the preparation very well. Thank you to my friends and team members for their assistance in this independent research.

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