Study on Soil Quality in Different Seasons Affecting Groundwater Quality for Domestic Use in Ban Suan Area, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang Province

Miss Nantikan Kanghae

Miss Chanuntida Paimaung

Miss Manatsanan Doungkong

Wichienmatu School Trang , Thailand

Advisor

Ms. Jiraporn Sirirat

Abstract

Research Title : Study on Soil Quality in Different Seasons Affecting Groundwater Quality for Domestic Use in Ban Suan Area, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang Province

Researchers Miss Nantikan Kanghae

Miss Chanuntida Paimaung

Miss Manatsanan Doungkong

Grade Level : Grade 11

Advisor : Ms. Jiraporn Sirirat

School : Wichienmatu School, Trang Province

This study aims to investigate the physical and chemical quality of groundwater in Ban Suan area, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang Province, and compare the groundwater quality from sample sources with standard physical and chemical groundwater quality criteria for domestic use. The study examines how soil conditions during the rainy season (September-October) and the dry season (December-January) affect groundwater quality. The study was conducted from September 27, 2024, to January 30, 2025.The results indicate that during the rainy and dry seasons, the average groundwater temperature was 26°C. The average dissolved oxygen levels were 3.75 mg/L and 2 mg/L respectively. The average pH values were 6.39 and 6.73. The average copper concentrations were 1 mg/L and 1.5 mg/L, while the average nitrate concentrations were 0 mg/L and 1 mg/L. The phosphate levels averaged 1.5 mg/L and 0.1 mg/L, and the iron concentrations were 0.5 mg/L and 0.75 mg/L. The soil fertility values (N, P, K) were 2.28 mg/L, 2.50 mg/L, and 4.66 mg/L, respectively. When comparison with the groundwater quality standards set by the Department of Groundwater Resources, the groundwater met the standard criteria. However, groundwater in the dry season exceeded the standard limits for iron and copper. After filtration, the groundwater quality improved to a level suitable for domestic use. It was found that the electrical conductivity (EC) of the soil during the dry season averaged 150 mS/m, a high value that contributed to elevated Fe and Cu levels. This increase was due to the decline in shallow groundwater levels, allowing deeper, more saline groundwater to seep into the shallow aquifer. This was evident from the relatively high salt concentration observed in the dry season.

Keywords : Water quality, Soil quality, Domestic water consumption

Introduction

Water is essential for the survival of all living organisms. There are two primary sources of water: surface water and groundwater. Groundwater, in particular, is a vital water resource that has been used for consumption in Thailand for a long time. It forms when rainwater infiltrates the ground and accumulates in underground water reservoirs. In areas where tap water is available, residents rely on the municipal water supply. However, in areas beyond the reach of municipal water services, people often turn to groundwater due to its accessibility and convenience as it can be extracted whenever needed. Moreover, groundwater wells are commonly located within residential areas, making them a practical water source for many communities.

Soil quality significantly affects groundwater quality. Soil characteristics such as mineral content and pH levels play a crucial role in influencing the composition of groundwater. Minerals in the soil help retain nutrients and can impact the dissolution of contaminants that may enter the groundwater supply. Meanwhile, soil pH affects nutrient absorption and the movement of pollutants. Seasonal changes, particularly during the rainy and dry seasons, further impact groundwater quality. During the dry season, soil mineral concentration and pH levels may increase affecting groundwater composition. Additionally, seasonal variations influence soil erosion and the accumulation of substances in the soil, which directly impact groundwater quality.

This study examines groundwater quality in the Ban Suan area, located at 75/5, Moo 9, Khok Lo Subdistrict, Mueang District, Trang Province. Water samples were analyzed to assess key properties, including pH, dissolved oxygen (DO), copper (Cu), nitrate (NO_3^-), phosphate (PO_4^{3-}) , iron (Fe), soil characteristics, soil fertility (N, P, K), soil temperature, and soil salinity. The findings will provide insights into groundwater quality and the factors contributing to its variations in the study area.

Objectives

1. To study the physical and chemical quality of groundwater in Ban Suan, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang Province.
2. To compare the physical and chemical properties of groundwater samples from Ban Suan, 75/5 Moo 9, with the groundwater quality standards.
3. To examine soil quality during the rainy season (September–October) and the dry season (December–January) and its effects on groundwater quality in both seasons.

Research Questions

1. How do the physical and chemical properties of groundwater affect its suitability for consumption and domestic use in Ban Suan, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang Province?
2. Does the groundwater quality in Ban Suan, 75/5 Moo 9, meet the standards for safe consumption?
3. How do seasonal variations in soil quality affect groundwater quality?

Research Hypotheses

1. Soil quality affects the concentration of contaminants in domestic water consumption due to the leaching of minerals and dissolved chemicals from the soil.

   Independent Variable : Soil quality

   Dependent Variable : Concentration of contaminants

   Controlled Variables : Study area at Ban Suan, 75/5 Moo 9, Khok Lo Subdistrict,Mueang District, Trang 92000; instruments and equipment used

2. Mineral content and pH levels in soil during the dry season influence the concentration of contaminants in domestic water, which may improve groundwater quality.

   Independent Variable : Mineral content and pH of soil during the dry season

   Dependent Variable : Concentration of contaminants

3. Controlled Variables : Study area at Ban Suan, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang 92000; instruments and equipment used

Materials and Equipment

1. Distilled water
2. Droppers and beakers
3. Thermometer
4. pH test kit
5. pH meter
6. Phosphate test kit
7. Copper test kit
8. Photography equipment
9. Notebook and writing tools
10. Dissolved oxygen test kit
11. Soil moisture meter
12. Water sample containers
13. Field manual for soil texture classification by touch method
14. Nitrate test kit
15. Water sample containers (duplicate entry, can be omitted)
16. Soil structure chart
17. Soil fertility test kit

Study Area Determination

The study will take place at Ban Suan, 75/5 Moo 9, Khok Lo Subdistrict, Mueang District, Trang 92000. Water and soil samples will be collected during two seasons by the rainy season (September–October) and the dry season (December–January). Soil samples will be collected from 4 locations at depths of 10 cm and 20 cm. Groundwater and filtered water samples used for consumption will also be collected. The sampling period will span from September 25, 2024, to January 30, 2025 (a duration of 4 months and 5 days).

2. Research Procedure

1. Preparation Phase

1. Define the research topic and select the area of interest for the study.
2. Conduct a literature review and gather relevant knowledge and theories related to the research.
3. Establish the objectives of the study.
4. Determine the specific locations for water sample collection within the study area.

2.Implementation Phase

1. Develop a work plan for the research.
2. Survey the study area where the research will take place.
3. Collect water samples for analysis to assess the quality of groundwater and drinking water. The relevant factors for measurement include dissolved oxygen (DO), copper (Cu), nitrate (NO_3^-), phosphate (PO_4^{3-}), and pH levels.
4. Analyze the data obtained from the survey and summarize the research findings.

Methods of Measurement

Methods of Measurement Hydrosphere and Methods of Measurement Pedosphere (Soil)

- **Part 1: Part 1: Study and Analysis of the Physical and Chemical Quality of Water for Domestic and Consumption Use.**

Examination of Groundwater and Filtered Water

Dissolved Oxygen (DO) Measurement

1. Rinse the sample collection bottle underwater 2-3 times, then fill it completely. Seal the lid underwater to prevent air bubbles. Be careful to avoid trapping air.
2. Slowly open the lid and add 2 drops of Reagent #1, followed by 2 drops of Reagent #2. Close the lid carefully to prevent air from entering.
3. Shake the bottle while keeping the lid closed. A brownish-yellow precipitate will form, indicating the presence of oxygen.
4. Allow the precipitate to settle to approximately half of the bottle.
5. Open the lid, add 5 drops of Reagent #3, then close the lid carefully to avoid air contact. Shake well until the precipitate completely dissolves and the sample turns yellow.
6. Pour the treated sample from step 5 into a new test tube up to the 5 ml mark.

7. Add Reagent #4 drop by drop, shaking after each drop, while counting the number of drops. When the sample turns pale yellow, add 2 drops of Reagent #5. The sample will turn blue. Continue adding Reagent #4 drop by drop, shaking and counting until the sample becomes colorless.
8. Use the total drop count to determine the dissolved oxygen concentration in milligrams per liter (mg/L) from the provided table.

pH Measurement

1. Calibrate the pH meter before use.
2. Pour the water sample into a beaker.
3. Submerge the pH meter probe in the water sample, ensuring the probe tip is fully covered.
4. Stir gently and wait for the pH meter reading to stabilize.
5. Record the pH value displayed on the meter.

Copper (Cu) Measurement

1. Use the Kyoritsu Packtest-Cu test kit.
2. Pull out the sealing strip at the tip of the test tube and turn the opening upward.
3. Squeeze the lower half of the tube firmly to expel the air inside.
4. Fill a beaker with the water sample, then dip the open end of the test tube into the sample. Gradually release your fingers to allow the sample to be drawn into the tube until it reaches half-full.
5. Shake the tube 5-6 times, then let it sit for 1 minute. Compare the resulting color with the color chart provided in the test kit.

Nitrate (NO_3^-) Measurement

1. Add 1 ml of the water sample to a test container.
2. Add 4 drops of NO_3^- reagent.
3. Add 1 level spoonful of NO_3^- test powder (using the provided spoon).
4. Stir gently for 30 seconds, then allow the solution to sit for about 3 minutes.
5. Compare the color of the solution with the color strip to determine the nitrate concentration.

Phosphate (PO_4^{3-}) Measurement

1. Clean the glass bottle before testing. Then, pour 10 ml of the water sample into the bottle.
2. Add 6 drops of Reagent #1, close the bottle, and shake well.
3. Add 6 drops of Reagent #2, close the bottle, and shake well again.
4. Add 1 level spoonful of Test Powder #3, close the bottle tightly, and shake vigorously.
5. Open the bottle and let it sit for 5 minutes, then compare the color with the color chart. Use the "10 ml + 0 ml" scale to determine the PO_4^{3-} concentration. If the color is dark green, the concentration is 2 mg/L.

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6. If further dilution is required, rinse the glass bottle, then mix 5 ml of the test sample with 5 ml of distilled water.
7. Repeat Steps 2 to 4 using the diluted sample.
8. Let the sample sit for 5 minutes, then compare it with the color chart. Use the "5 ml + 5 ml" scale to determine the PO_4^{3-} concentration. If the color is dark green, the concentration is 4 mg/L.
9. If needed, dilute the sample further **(**2 ml of test water + 8 ml of distilled water**)** and repeat the process to obtain more accurate results.

Iron (Fe) Measurement

1. Rinse the test tube several times with the water sample, then fill it up to the 5 ml mark. Wipe the outside dry.

2. Add 2 level spoonfuls of Test Reagent #1 (using the provided measuring spoon). Close the lid and shake gently. (This reagent will not dissolve completely.)

3. Add 5 drops of Test Reagent #2, close the lid, and shake gently.

4. Wait for 10 minutes under natural light.

5. Place the test tube on the color comparison chart and compare the color by looking from the top view to determine the iron concentration.

➢ Part 2 Soil Quality Study

Soil Cohesion Test

1. Collect soil particles from the topsoil layer. If the soil is dry, moisten it by spraying water before extracting the particles to observe soil cohesion. Repeat this process for each soil layer.
2. Hold a soil particle between your thumb and index finger, and gently press until it breaks apart.
3. Record the observed cohesion characteristics in the data log.

pH Measurement of Soil

1. Weigh 20 grams of dry, sieved soil and transfer it into a soil beaker.
2. Add 20 or 100 ml of distilled water to achieve a 1:1 soil-to-water ratio.
3. Stir the mixture using a glass rod for 30 seconds, then let it sit for 3 minutes. Repeat this process 5 times.
4. After the final stirring, let the soil settle until clear water forms on the upper layer.

5. Dip a pH test strip or a calibrated pH meter into the clear liquid without touching the sediment. Wait until the reading stabilizes, then record the pH value.

Soil Fertility (N, P, K) Measurement

1. Weigh 20 grams of dry, sieved soil and place it into a soil beaker.
2. Add 100 ml of distilled water and stir thoroughly.
3. Dip an NPK soil tester into the solution.
4. Record the N, P, and K values obtained from the measurement.

Soil Temperature Measurement

1. Pour 250 ml of room-temperature water into a beaker, ensuring the water level is at least 4 cm high.
2. Submerge both a standard thermometer and a soil thermometer into the water.
3. Wait for 2 minutes and compare the temperature readings of both thermometers. If the difference is less than 2°C, the soil thermometer is calibrated.
4. If the difference is greater than 2°C, wait for another 2 minutes.
5. If the readings still differ by more than 2°C, adjust the calibration screw at the bottom of the soil thermometer using a wrench until both thermometers display similar values.

Soil Salinity Measurement

1. Weigh 20 grams of dry, sieved soil and mix it with 100 ml of distilled water, maintaining a 1:5 soil-to-water ratio.
2. Stir the mixture with a glass rod for 30 seconds, then let it sit for 3 minutes. Repeat this process 5 times.
3. Allow the soil to fully settle.
4. Use a salinity meter to measure the soil salinity.
5. Record the measured salinity value.

Soil Moisture Measurement

1. Collect soil samples from depths of 10 cm and 20 cm at four different locations.
2. Label each sample with its depth and location details.
3. Use a Soil Moisture Meter to measure the moisture content of each sample.
4. Record the moisture values obtained from the measurements.

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1. Analysis and Research Findings

The table 1 shows the geographical coordinates of water and soil sampling points.

Water sampling location	Geographical coordinates.	
	Latitude (N)	**Longitude (E)**
75/5 Moo 9, Baan Suan, Ko Klo, Mueang, Trang 92000, Thailand.	7.5033889	99.6082500

Image 1 shows the map of the water and soil sampling points at the location 75/5 Moo 9, Baan Suan, Ko Klo , Mueang , Trang . **Source**: Map application on the iOS system.

Table 2 Duration of Water and Soil Sampling

Sampling Occasion	Duration of Water and Soil Sampling	
	Day/Month/Year	Time
1	27th September 2024	17.00-18.00
2	25th October 2024	17.00-18.00
3	25th December 2024	17.00-18.00
4	30th January 2025	17.00-18.00

The analysis of groundwater quality and soil quality, both physical and chemical, was conducted by collecting water samples at the location of 75/5 Moo 9, Ban Suan, Ko Klo Subdistrict, Mueang District, Trang Province. Various parameters were measured in the field, including water temperature, dissolved oxygen (DO), pH, total copper, total nitrate, total phosphate, iron (Fe), soil fertility (N, P, K), soil temperature, and salinity. The procedures and methods for testing were carried out following the guidelines of GLOBE Thailand, as shown in Tables 3, 4, and 5.

Study Results

Chapter 1: Study and Analysis of Physical and Chemical Water Quality for Consumption and Domestic Use

- **Study the properties of groundwater quality for domestic use and filtered water for consumption.**

Table 3 Study of the physical and chemical properties of groundwater quality for domestic use and filtered water for consumption at the location 75/5, Baan Suan, Ko Klo Subdistrict, Mueang District, Trang Province.

Examination of Groundwater

Parameter	Average Quality of groundwater used for domestic purposes	
	Rainy season	Summer
Temperature (°C)	26	26
pH (Acidity/Alkalinity) (pH)	6.39	6.73
ECw (mS/m)	100	150
Dissolved Oxygen (mg/l)	3.75	2
Copper (mg/l)	1	1.5
Nitrate (mg/l)	0	1
Phosphate (mg/l)	1.5	0.1
Iron (mg/l)	0.5	0.75

From Table 3, the analysis of the physical and chemical quality of groundwater used for domestic purposes in Ban Suan, 75/5, Khok Lo Subdistrict, Mueang District, Trang Province, is shown in Table 5.During the rainy season (September-October), the average water temperature was 26°C, the average pH was 6.39, and the average electrical conductivity (EC) was 100 mS/m. The average dissolved oxygen was 3.75 mg/L, copper concentration was 1 mg/L, nitrate concentration was 0 mg/L, phosphate concentration was 1.5 mg/L, and iron concentration was 0.5 mg/L.During the dry season (December-January), the average water temperature remained at 26°C, while the average pH increased to 6.73. The electrical conductivity rose to 150 mS/m. The average dissolved oxygen decreased to 2 mg/L. The copper concentration increased to 1.5 mg/L, nitrate concentration rose to 1 mg/L, phosphate concentration dropped to 0.1 mg/L, and iron concentration increased to 0.75 mg/L.

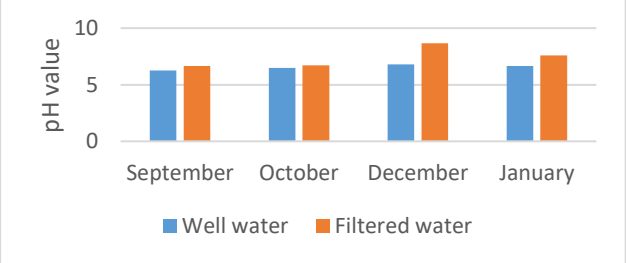
Examination of Filtered Water

Parameter	Quality of filtered water used for consumption	
	Rainy season	Summer
Temperature (°C)	28	28.5
pH (Acidity/Alkalinity) (pH)	6.58	8.13
Dissolved Oxygen (mg/l)	6	6.75
Copper (mg/l)	0	0
Nitrate (mg/l)	0	0
Phosphate (mg/l)	0.5	0.53
Iron (mg/l)	1	0

Table 4 shows the results of the analysis of filtered water quality used for consumption, both physical and chemical, at 75/5 Moo 9, Ko Klo Subdistrict, Mueang District, Trang Province. The results are displayed in Table 6, showing the following During the rainy season (September to October) Average pH value: 6.58 Average dissolved oxygen 6 mg/L Average phosphate 0.5 mg/L Average iron (Fe): 1 mg/L During the dry season (December to January) Average pH value: 8.13 Average dissolved oxygen 6.75 mg/L Average phosphate 0.53 mg/L No detectable iron No detectable copper No detectable nitrate in the water during two seasons.

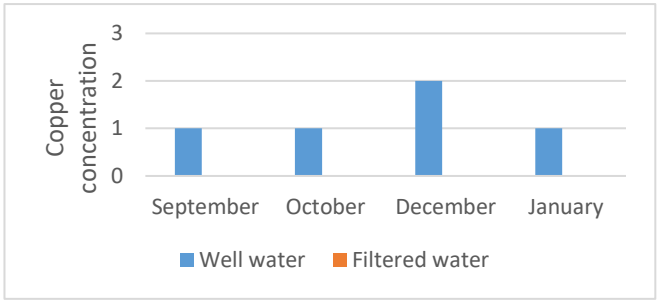
Graph comparing the analysis of water quality in different seasons.

1. Water Quality



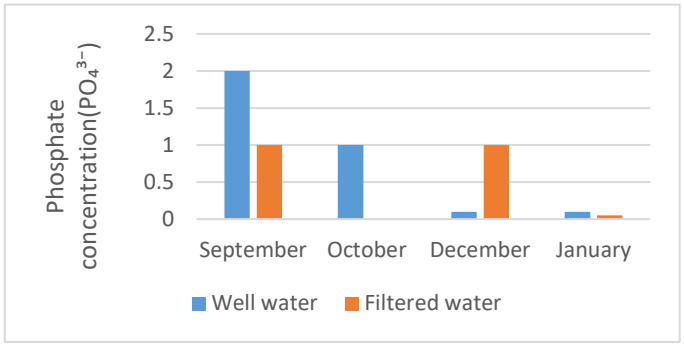
Graph 1.1 shows the comparison of pH values.

The pH value of water during the rainy season tends to be lower than in the dry season. During the rainy season, the average pH ranges from 6.39 to 6.58, while in the dry season, the average pH ranges from 6.73 to 8.13. The pH of the soil tends to decrease due to rainfall leaching basic minerals, which affects the pH of the water, causing it to decrease as well.



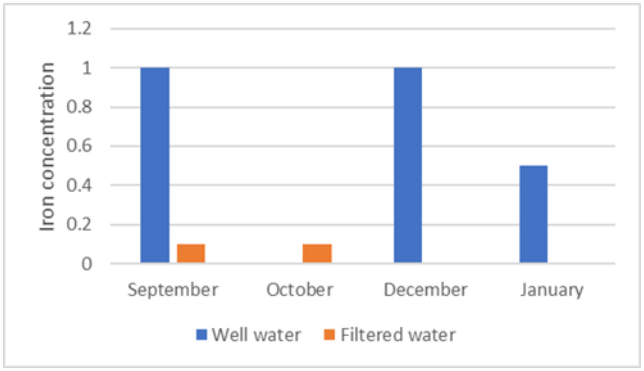
Graph 1.2 shows the comparison of copper (Cu) values.

The copper levels in water during the rainy season tend to be lower than in the dry season. In the dry season, the average copper value ranges from 0 to 1.5 mg/L, while in the rainy season, the average copper value ranges from 0 to 1 mg/L.



Graph 1.3 shows the comparison of phosphate (PO_4^{3-}) values.

Phosphate levels are higher in the rainy season (0.5–1.5 mg/L) than in the dry season (0.1–0.53 mg/L) due to rainfall washing topsoil and carrying nutrients into surface water, potentially affecting groundwater.



Graph 1.4 shows the comparison of iron (Fe) values.

The iron levels in water during the rainy season tend to be lower than in the dry season. In the dry season, the average iron value ranges from 0 to 0.75 mg/L, while in the rainy season, the average iron value ranges from 0.5 to 1 mg/L. The higher temperatures in the dry season lead to increased water evaporation resulting in higher concentrations of iron in the water.

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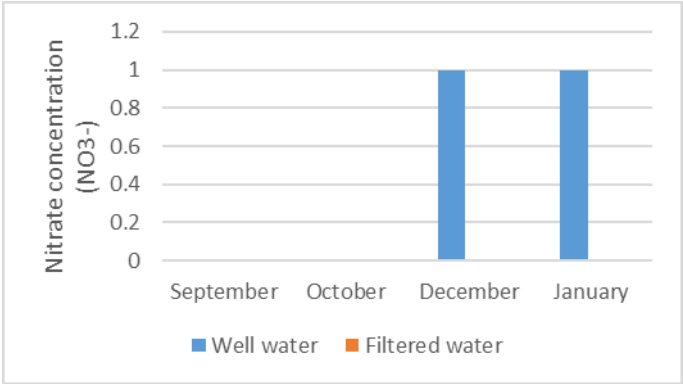


Graph 1.5 shows the comparison of nitrate (NO_3^-) values.

The nitrate levels in water during the rainy season tend to be lower than in the dry season. In the dry season, the average nitrate value ranges from 0 to 1 mg/L, while in the rainy season, the average nitrate value is 0 mg/L. This is because rainfall washes nitrates away from the topsoil, resulting in a decrease in nitrate level

➢ **Study of soil quality in different seasons and its effect on water quality.**

Table 5 details the collection and analysis of soil samples, including temperature, soil moisture, pH, soil salinity, and soil fertility, at the location of 75/5 Moo 9, Ko Klo Subdistrict, Mueang District, Trang Province.

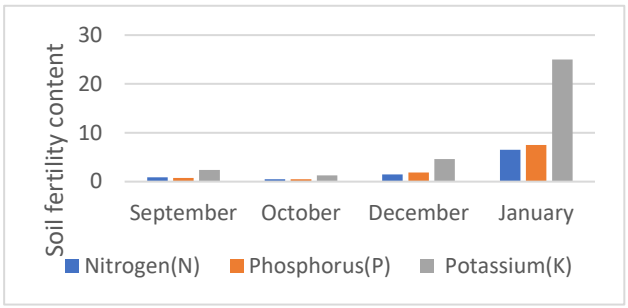
Parameter	Average Temperature /Soil Humidity/pH (Acidity/Alkalinity)/ Soil Salinity/N, P, K (Nitrogen, Phosphorus, Potassium)			
	10 cm.		20 cm.	
	Rainy season	Summer	Rainy season	Summer
Temperature (°C)	25.75	27.25	24.5	25.5
Soil Moisture (MC%)	5.75	1	2.13	2
pH Level	7.3	7.73	7.07	7.66
Salinity (ppm)	69	79.5	66.5	77.63
N (mg/L)	0.38	5	0.75	3
P (mg/L)	0.38	6	0.25	3.38
K (mg/L)	2.25	4.63	1.38	10.38

From Table 5, the analysis of soil temperature, moisture, pH, salinity, and fertility (NPK) in Ban Suan, 75/5, Khok Lo Subdistrict, Mueang District, Trang Province, is shown in Table 3.

During the rainy season (September-October), the soil pH ranged from 7.07 to 7.30, and the soil salinity ranged from 66.5 to 69 ppm. The nitrogen (N) content ranged from 0.38 to 0.75 mg/L, phosphorus (P) ranged from 0.25 to 0.38 mg/L, and potassium (K) ranged from 1.38 to 2.25 mg/L.During the dry season (December-January), the soil pH increased to a range of 7.66 to 7.73, and the soil salinity rose to a range of 77.63 to 79.5 ppm. The nitrogen content increased significantly to a range of 3 to 5 mg/L, phosphorus ranged from 3.38 to 6 mg/L, and potassium ranged from 4.63 to 10.38 mg/L.These seasonal variations in soil fertility (N, P, K) and other parameters have a direct impact on groundwater and filtered water quality. The increased salinity and nutrient concentrations in the dry season contribute to higher levels of certain dissolved substances in groundwater affecting its suitability for consumption and domestic use

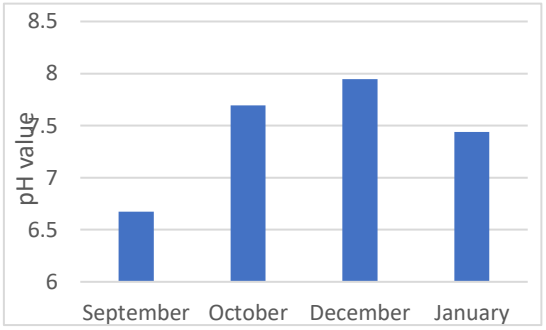
Graph showing the comparison of soil analysis in different seasons.

2. Soil Quality



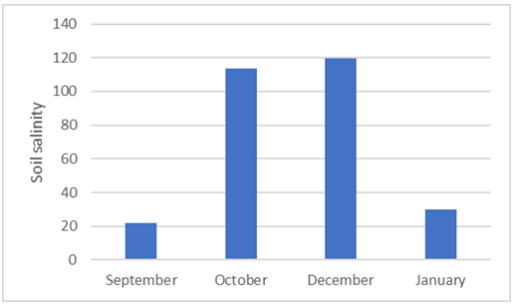
Graph 2.1 shows the comparison of soil fertility (NPK) values.

Soil fertility in the rainy season is lower than in the dry season because rainfall washes away nutrients from the soil. During the rainy season, nitrogen ranges from 0.38% to 0.75%, phosphorus from 0.25% to 0.38%, and potassium from 1.38% to 2.25%. In contrast, during the dry season, nitrogen ranges from 3% to 5%, phosphorus from 3.38% to 6%, and potassium from 4.63% to 10.38%. In the dry season, evaporation exceeds leaching, allowing nutrients to remain in the soil, resulting in higher soil fertility.



Graph 2.2 shows the comparison of soil pH values.

The soil pH during the rainy season tends to be lower than in the dry season. In the rainy season, the pH ranges from 7.07 to 7.30, while in the dry season, it ranges from 7.66 to 7.73. The soil pH tends to decrease because the rainfall washes away basic minerals from the soil.



Graph 2.3 shows the comparison of soil salinity values.

The soil salinity during the rainy season tends to be lower than in the dry season. In the rainy season, the salinity ranges from 66.5 to 69 ppm. While in the dry season, it ranges from 77.63 to 79.5 ppm. Soil salinity is generally higher in the dry season due to the higher evaporation rate, which leads to an accumulation of salts on the soil surface. In contrast, the increased rainfall during the rainy season helps to leach the salts out of the soil reducing the salinity.

Research Results and Discussion

1. Physical Water Quality: the average pH value was 6.56 and the electrical conductivity averaged 125 mS/m. Regarding the chemical water quality, the average iron (Fe) concentration was 1.25 mg/l, which exceeds the groundwater standard for consumption as specified by the Ministry of Industry, Announcement No. 12. When the groundwater quality is improved using activated carbon, the iron concentration will not exceed the standard limits. For water to be used for consumption, it should always be treated to improve its quality. After filtration, the groundwater quality for consumption meets the standard set by the Department of Groundwater Resources, Ministry of Industry (No. 12, 1999).

2. Summer Groundwater: In the summer, untreated groundwater has an iron concentration exceeding the standard for water use set by the Ministry of Industry, Announcement No. 12. After treatment with filtration, the groundwater quality in both the summer and rainy seasons for all parameters complies with the groundwater quality standards suitable for consumption. It was found that heavy metals in the groundwater during the summer were higher than in the rainy season. The shallow groundwater level rises during the rainy season due to water accumulation in the area and rainwater replenishing the underground water. Subsequently, the level drops by 5-6 meters as the rainfall decreases and groundwater is extracted. When the shallow groundwater level decreases during the summer and falls below the piezometric surface of the bedrock, confined groundwater rises and mixes with shallow groundwater. This causes an increase in salinity in shallow groundwater, which is more noticeable near the surface. This can be observed in areas where the salinity levels in shallow groundwater and deep groundwater are compared by showing relatively high values. There is a correlation between the shallow groundwater level and the EC (electrical conductivity) of the wells monitoring the shallow groundwater.

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The Project Team

Miss Nantikan Kanghae

Miss Chanuntida Paimaung

Miss Manatsanan Doungkong

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IVSS Badges

I am a Collaborator

We have worked as a strong and effective team by clearly dividing tasks. Each member was able to fully carry out their responsibilities while supporting each other throughout the process. We emphasized leadership, being good followers, and exchanging ideas effectively. Our unity and mutual encouragement helped us overcome obstacles, leading to the successful completion of the project. This experience has been essential in developing our teamwork skills for the future.

I am a Data Scientist

We conducted field surveys to gather all the necessary data for the research. We studied the area in real-life conditions and searched for standards to compare groundwater quality for consumption. By following a structured process involving data management, collection, verification, and analysis, we ensured that the data obtained was accurate and provided the most effective results. The data we gathered was then used for further development.

I make an Impact

We studied the quality of groundwater and filtered water across different seasons to assess the impact on water quality for consumption. The findings showed that weather conditions and seasons significantly influence water quality. The results can be shared with the local community to raise awareness of the water quality used in daily life and promote better water usage practices. For example, groundwater can be used for agricultural purposes. These insights can guide more efficient water management at the community level.

Appendix



The study site for collecting water and soil is located at 75/5 Ban Suan, Khok Lor Subdistrict, Mueang District, Trang Province.


Dig holes with depths of 10 cm and 20 cm at four locations.


Collect groundwater and filtered water samples to study water quality.


Analyze the physical and chemical properties of the water.


Analyze the physical and chemical properties of the soil.