



# Relationship Between Soil Quality and Distance from Water Sources in Nansato Area

## Landslide Occurrence Wichienmatu School

### Abstract

This study investigates the relationship between soil quality and distance from water sources in landslide-prone areas at Nansato Waterfall, Trang Province. The research involved fieldwork to analyze soil structure, cohesion, pH, and moisture at varying distances from water. Results indicated that areas closer to water sources exhibited higher soil moisture and neutral to slightly alkaline pH levels, factors directly related to soil stability and landslide occurrences.

Keywords: Landslide, Soil Structure, Soil Cohesion, Soil pH, Soil Moisture

### Research Question

How do soil quality and distance from water sources differ in landslide areas?

### Introduction Content Knowledge

Trang Province's sloped topography makes it highly susceptible to landslides, particularly during the rainy season. The Nansato Waterfall area is specifically prone to soil erosion due to its slopes and water flow. This research seeks to understand geographic factors—such as soil strength and water retention—to aid in assessing risk and developing preventive measures for the community.

### Research Methods

The study focused on a landslide area near Nansato Waterfall (Latitude 7.32604 N, Longitude 99.85481 E) Controlled variables Independent Distance from water sources Dependent Soil quality Controlled Study area size, survey date, survey tools for equipment to use including CU Smartlens 20X, soil testers, universal indicators, and measuring tapes.

### Carrying Out Investigations

Researchers followed GLOBE protocols to select three study points:

1. Soil Structure/Cohesion: Analyzed using CU Smartlens and texture charts.
2. pH & Moisture: Measured at a 5 cm depth using a multipurpose tester and indicator paper.
3. Distance: Measured from water sources to study points to assess soil flow and subsidence.



### GLOBE Badges

Be a Collaborator

All team members are listed including students from the same school or schools from around the world, along with clearly defined roles, how these roles support one another, and descriptions of each student's contribution. The descriptions clearly indicate the advantages of the collaboration. If the students collaborated with students from another school, describe how working with other schools improved the research.

Be a Data Scientist

The report includes in-depth analysis of students' own data as well as other data sources. Students discuss limitations of these data, make inferences about past, present, or future events and use data to answer questions or solve problems in the represented system. Consider data from other schools or data available from other databases.

Make an Impact

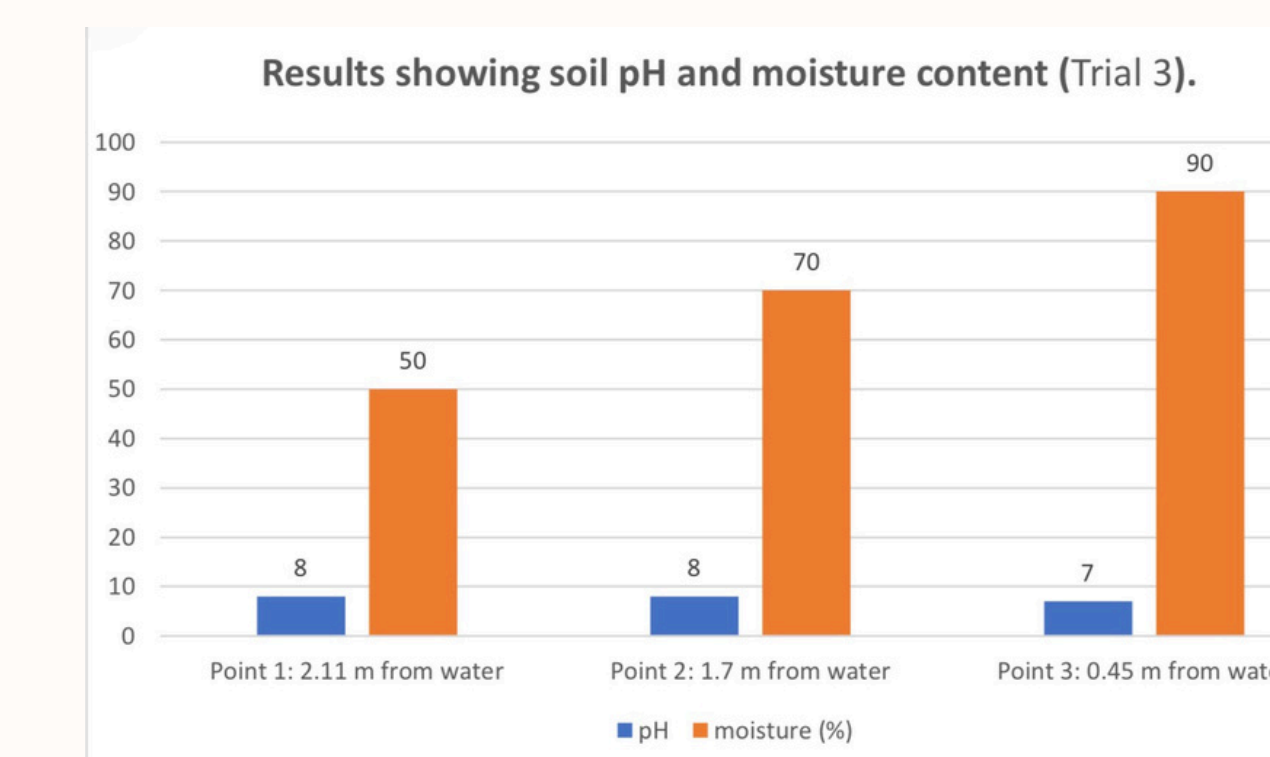
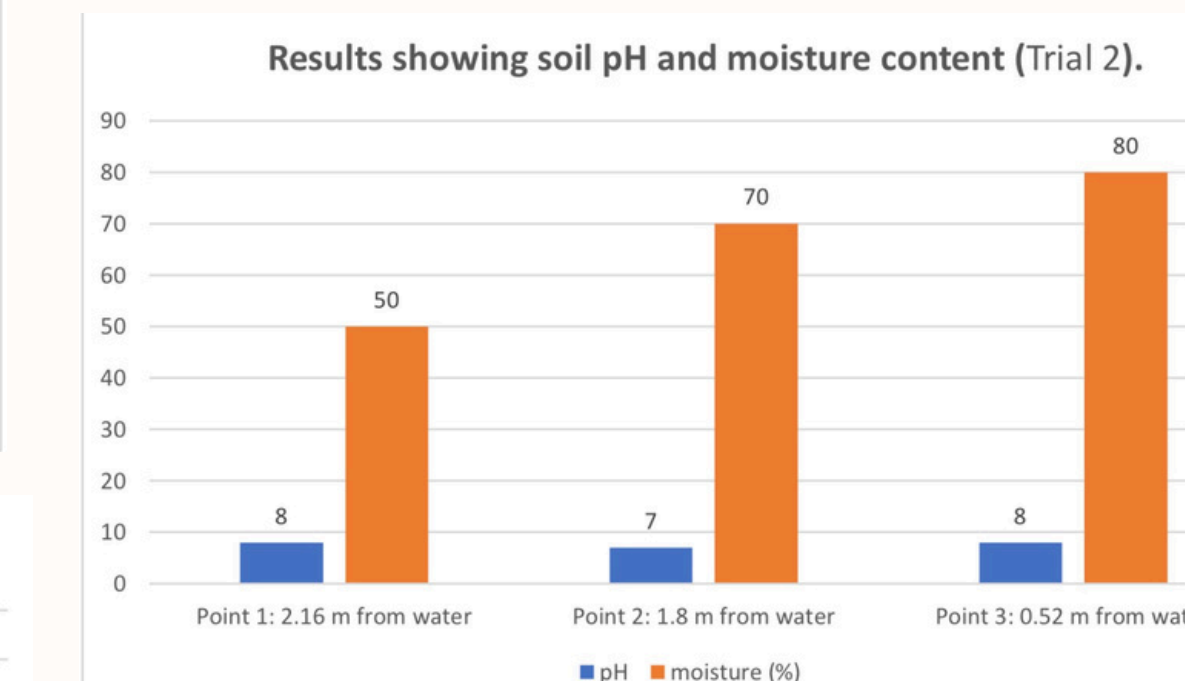
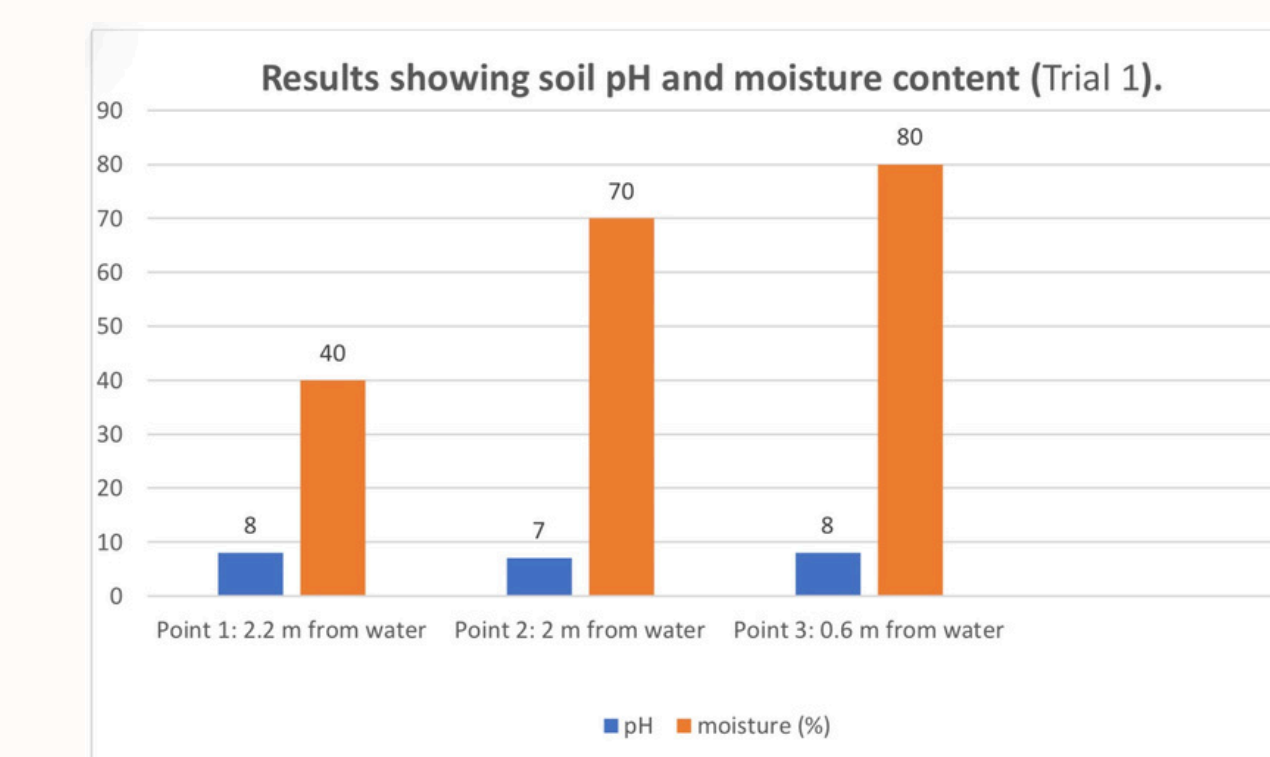
The report clearly describes how a local issue led to the research questions or makes connections between local and global impacts. The students need to clearly describe or show how the research contributed to a positive impact on their community through making recommendations or taking action based on findings.

### Results

Study Area	Soil Structure	soil structure photos	soil cohesion
Point 1	square head soil		tight
Point 2	Single grain		Loose and crumbly
Point 3	round lump		tight

Soil Physicals:

- Point 1 had an angular blocky structure and tight cohesion;
- Point 2 was single-grained and loose;
- Point 3 was rounded blocky and tight.



Summary of Soil pH and Moisture (Trials 1–3)

The following summaries describe the soil conditions across three separate measurements:

Trial 1 (Table 2):

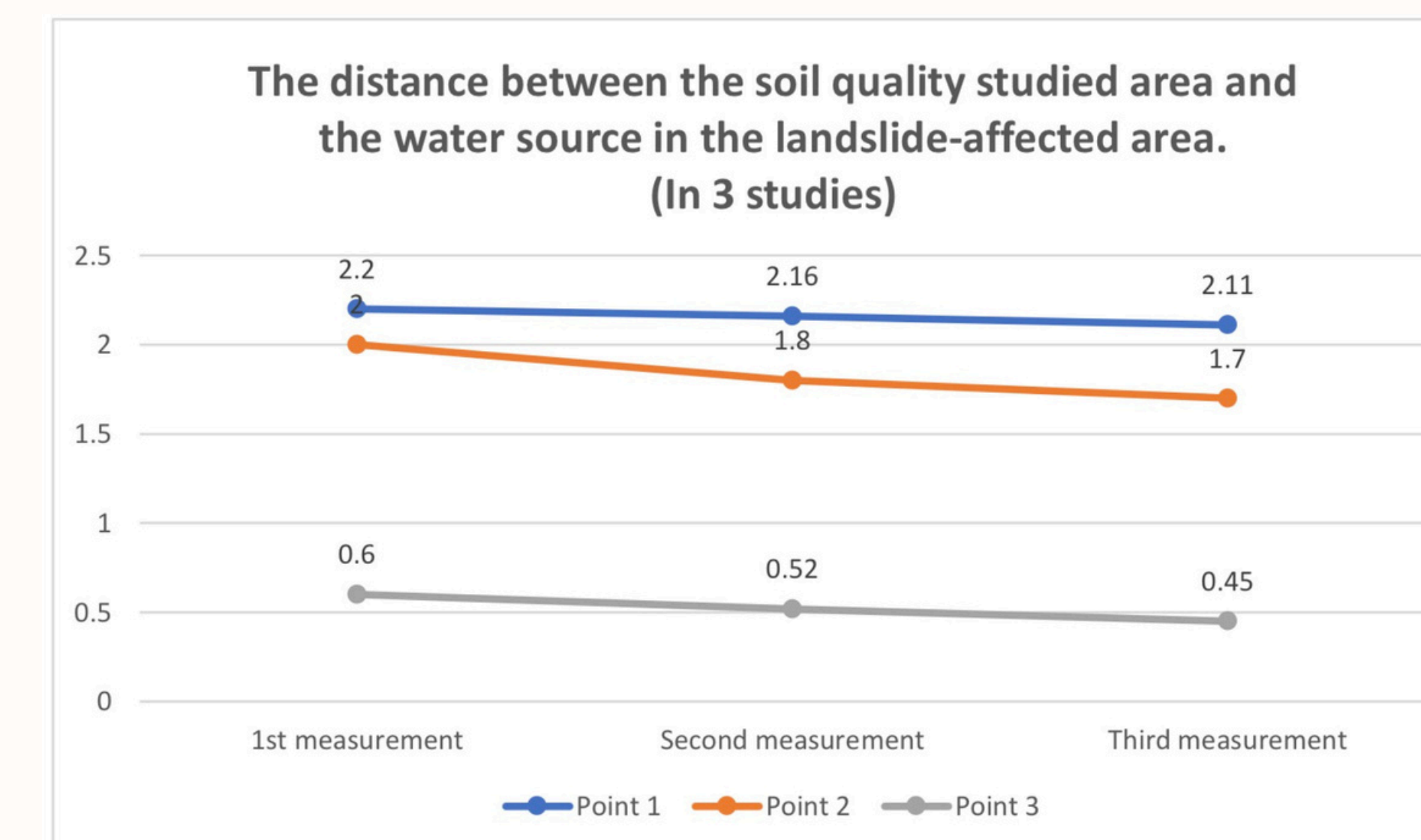
- Point 1 (2.2 m from water): pH is 8 (slightly alkaline); moisture is 40%.
- Point 2 (2.0 m from water): pH is 7 (neutral); moisture is 70%.
- Point 3 (0.6 m from water): pH is 8 (slightly alkaline); moisture is 80%.

Trial 2 (Table 3):

- Point 1 (2.16 m from water): pH is 8; moisture is 50%.
- Point 2 (1.8 m from water): pH is 7; moisture is 70%.
- Point 3 (0.52 m from water): pH is 8; moisture is 80%.

Trial 3 (Table 4):

- Point 1 (2.11 m from water): pH is 8; moisture is 50%.
- Point 2 (1.7 m from water): pH is 8; moisture is 70%.
- Point 3 (0.45 m from water): pH is 7; moisture is 90%.



Summary of Distance Changes (Table 5)

The measurements of the distance between the study points and the water source showed a consistent trend over time:

- The distance from the water source decreased across all three study points (Point 1, Point 2, and Point 3) throughout the three measurement periods.

### Discussion

The data supports the hypothesis that soil quality varies by distance from water. High moisture levels (up to 83.33% average) near water sources (0.52 m average) correlate with specific soil structures like rounded nodules. The observed decrease in distance from the water source over the three measurement periods indicates the physical instability of the soil in this landslide-affected zone.

### Conclusions & Next Steps

The study concludes that soil closer to the water source at Nansato Waterfall maintains higher moisture and neutral pH, while further points are drier and more alkaline.

- Next Steps for future research should collect "before and after" landslide data to more accurately identify the specific triggers and contributing factors of soil failure in this region.

### Bibliography

- Matichon Online (2025): Report on landslides above Nansato Waterfall.
- CH7 (2025): Coverage of severe flooding and landslides in Trang.
- Naewna Online: Reports on flash floods and hardship in Palian District.