Hydrogeology Exploration for Groundwater Management in Sawathi Subdistrict, Muang Khon Kaen District, Khon Kaen Province, Northeast Thailand.

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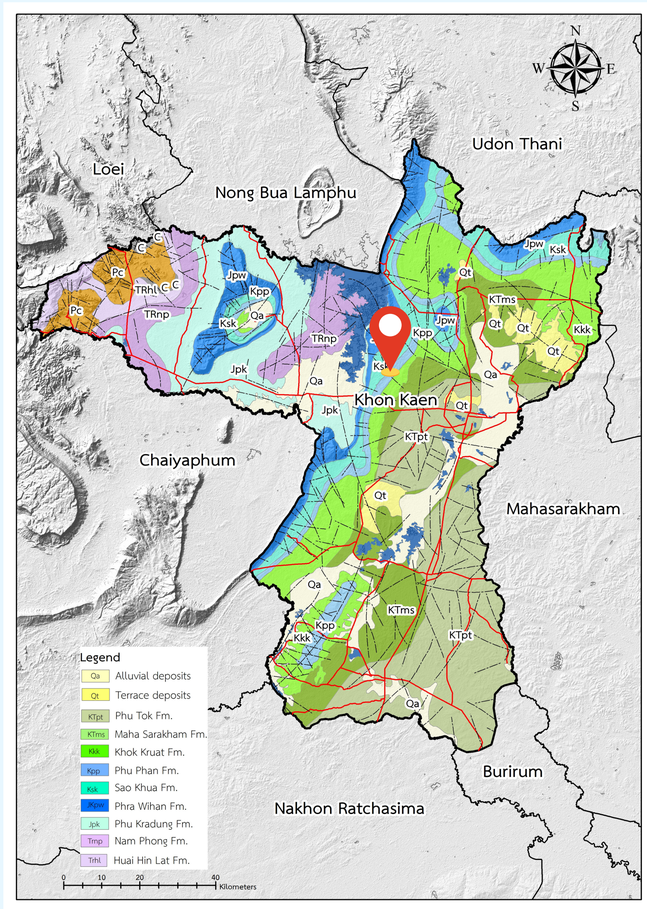
Study area



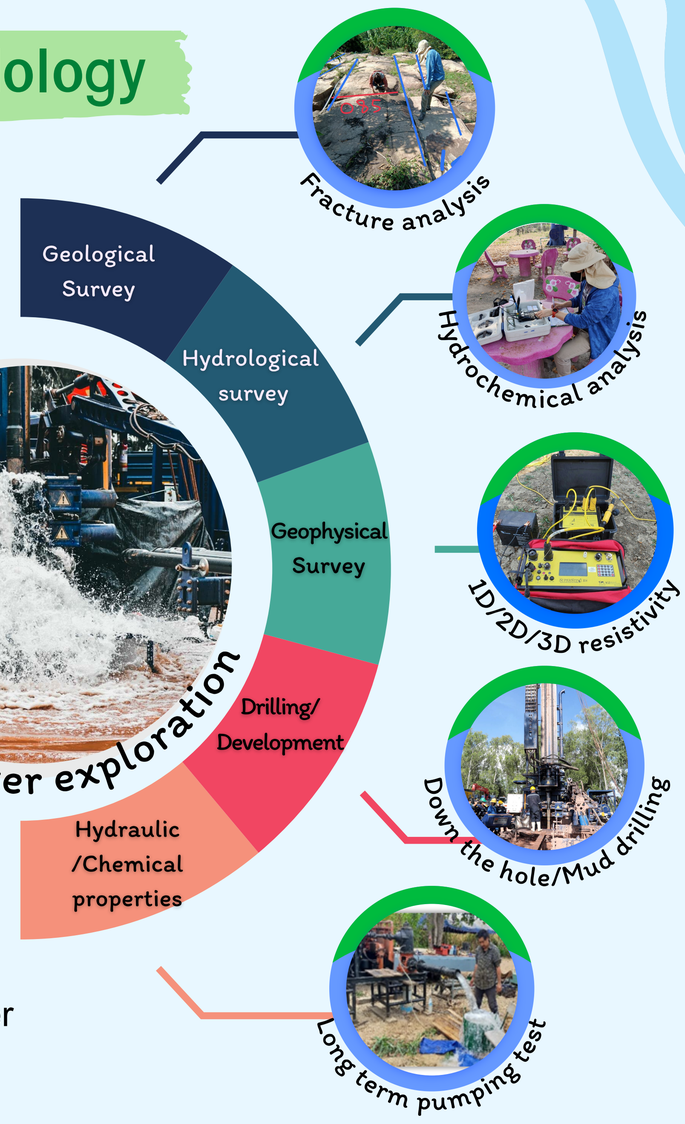
Where's study area?

- **Sawathi Subdistrict** is located in Muang district Khon Kaen province, northeast Thailand.
- This area is geographically located on high terrain.
- Population around 16,464 and 3,429 households.
- The geology is composed of sandstone, siltstone, and mudstone bedrocks of the Khorat group.
- In this area groundwater was bearing within a fractured rock or contact boundary rocks which is challenging to drill and develop.
- People have suffered from water shortages in a drought every year due to this area having fewer surface-water reservoirs and little rainfall. Water supplies will be barely sufficient year-round.

Objective

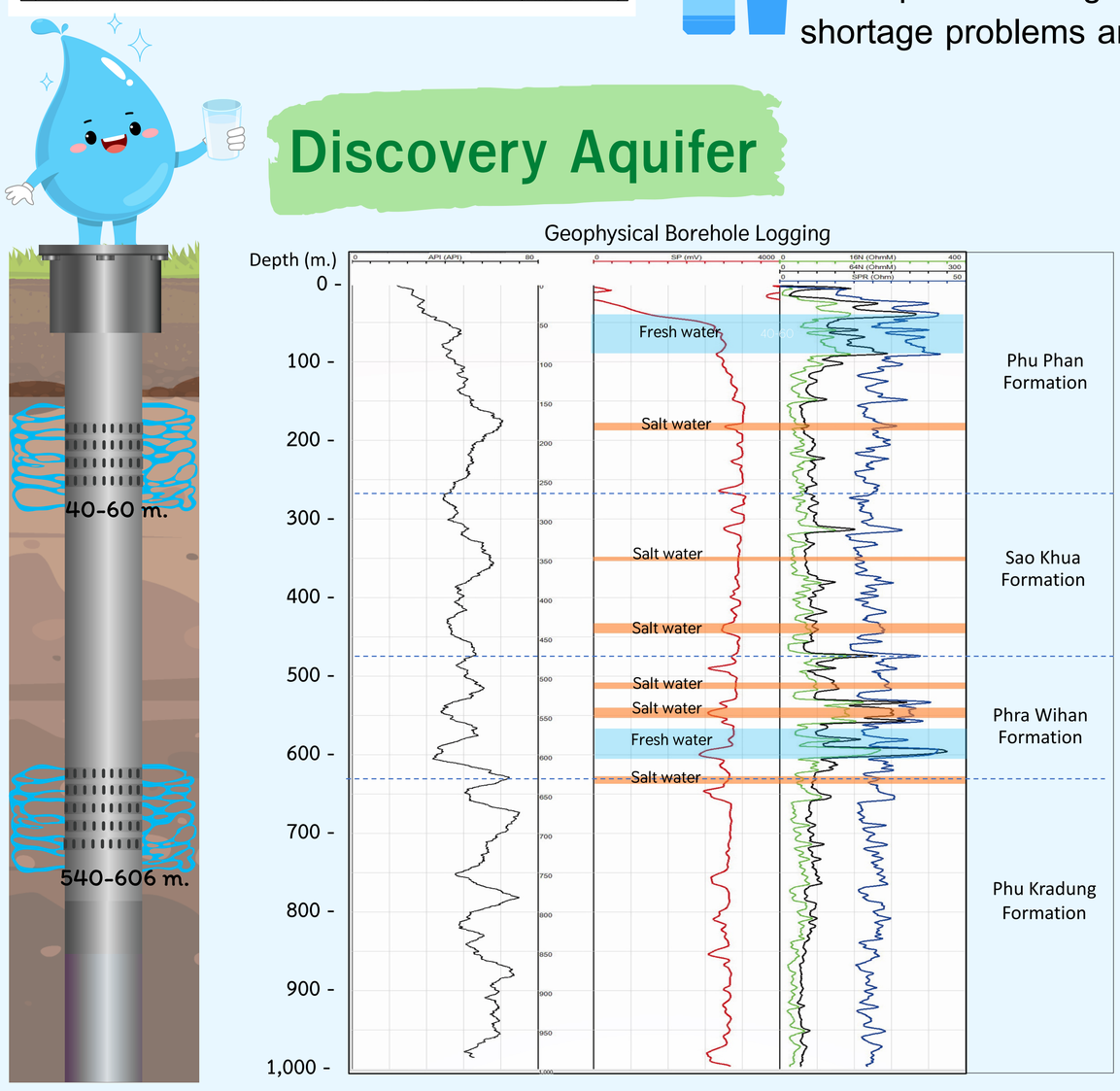
To explore new groundwater resources for resolving water shortage problems and managing water resources in Sawathi.

Methodology

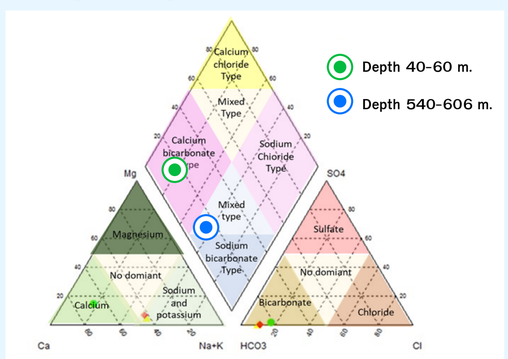


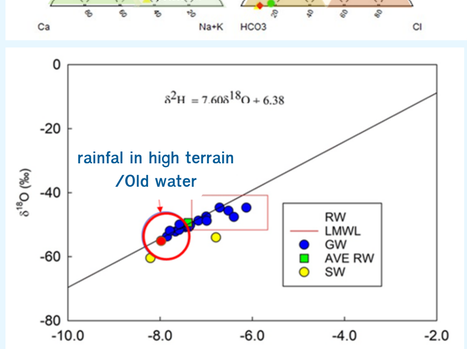
Method of groundwater exploration started with a detail geological survey, hydrological survey, and geophysical survey. These were conducted to locate a suitable location for the drilling operation. Followed by drilling a **1000-meter-deep well**, then using borehole logging tools to determine the aquifer's physical properties and the quality of groundwater. A pumping test was conducted subsequently to evaluate the aquifer's hydraulic properties.

Discovery Aquifer



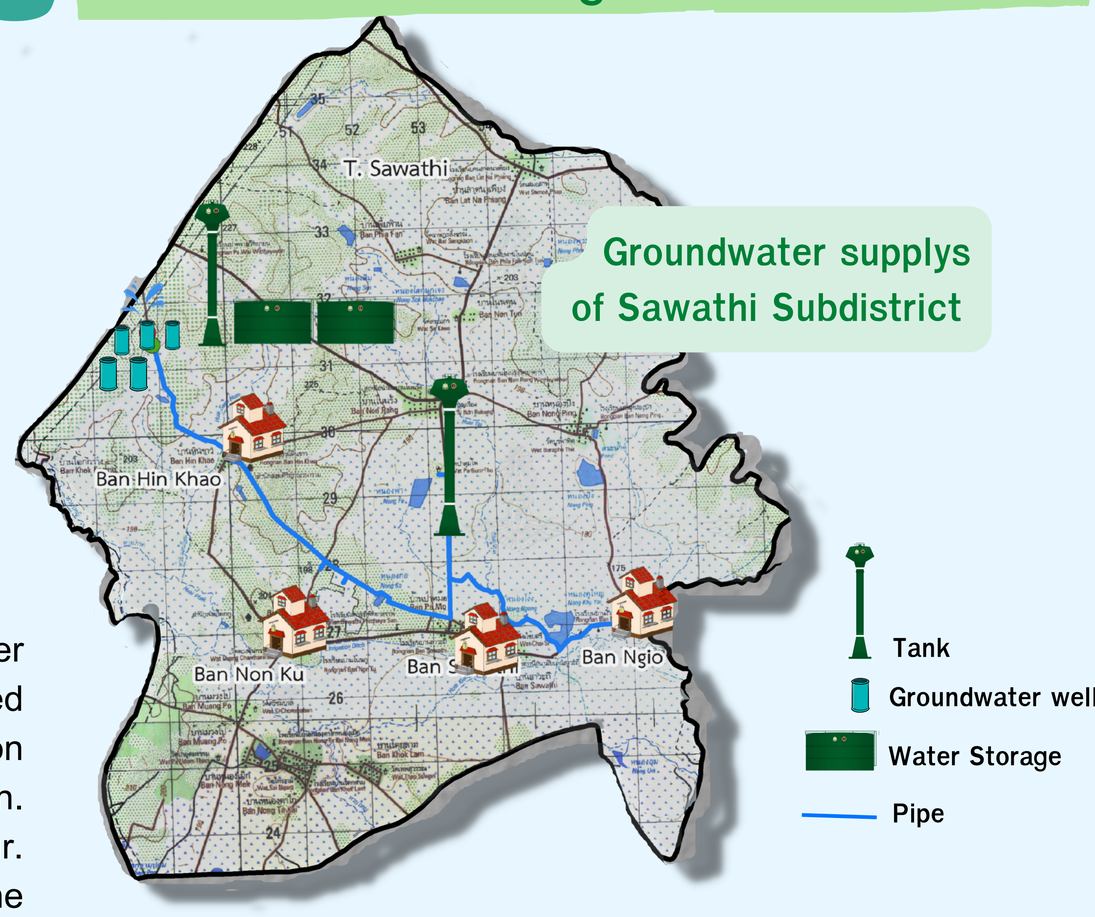
At the "1,000-meter-deep" well, the two fresh aquifers were found at depths 40-60 and 540-606 meters. These two aquifers are contained good groundwater quality and high quantity. The first aquifer is an exciting aquifer that is usually used for consumption. The second aquifer is a new deep aquifer in Phra wihan Formation which is the pioneer project for deep groundwater development in this Formation. Both aquifers provide high water yield which is approximately 21 cubic meters/hour. The isotope study shows the main origin of the water is rain which represents the age of groundwater defined at the depth.





Depth (m.)	Yield (m^3/hr.)	Water Type	TDS (m/g)	Year (C-14)
40-60	13	Calcium bicarbonate type	<500	<200
540-606	9	Mixed type	<500	20,167± 680 (B.P.)

Groundwater Management for Sawathi



For consumption use, groundwater should develop a depth of 40-60 meters (>5 wells). Water supply should construct on a large scale to support four villages' needs around 1,000 households.

For industrial use, groundwater development should consider at depth of 540-606 meters for avoiding problems with water consumption and agriculture.