THE RELATIONSHIP BETWEEN WATER QUALITY AND IMPROVEMENTS OF MOUNTAIN STREAM TAP WATER IN BALO SUB DISTRICT ADMINISTRATIVE ORGANIZATION RAMAN DISTRICT YALA PROVINCE PATTANI WATERSHED SOUTH THAILAND

Vichit Rangpan, Yala Rajabhat University
Rusna Khaemoh, Yala Rajabhat University

ABSTRACT

The aim of this research was to investigated (*1*) *land use in the area of water supply Tap Water* **(***2*) *compare the water quality of the physical, chemical, and biological properties of Tap Water Quality with standard tap water (3) to study the relationship between water quality, physical and chemical and* (*4*) *ways to improvements of Mountain Stream Tap Water in Balo sub-district Administrative Organization Raman District Yala Province. The research methodology was a Mix Method Research, survey research, and qualitative research. The finding was as follows*: *Land use water that has a wetlands area - high plateau and mountain areas. Land use rubber, fruit orchards, and rice-growing areas including coconut and used in the locks to the public water supply in the area has mountains to the consumer. Analysis comparing the water quality by the physical, chemical, and biological properties of Qualitative and improvements of Mountain Stream Tap Water in Balo sub-district Administrative Organization Raman District Yala Province with standard tap water. Compare the physical, chemical, and biological water quality standards for drinking water. Found to meet drinking water standards. Effects of different water Tap Water Quality NTU were 3.92 NTU and the lowest value 0.56 NTU temperature was the highest 35.17 lowest 33.50 TDS were 28.31 mg/L and the lowest 16.04 mg/L TSS highest 65.99 mg/and the 8.52 mg/L and pH is the highest 6.54 and lower is 5.68 Total Hardness as* $CaCO_3$ (*mg/L*) *is the 30.43 mg/L and the lowest 21.12 mg/L and Chloride highest 16.25 mg /L and lowest 10.45 mg/L. The relationship between physical and chemical water quality of each station found TDS to TSS and Total Hardness as* $CaCO_3$ *correlated significantly at the 0.01. The consumer found the home water supply authorities and The Administrative Committee of the lack of cooperation, communication cooperation education public relations lack of support from government and related agencies.*

Keywords: Water Quality, Improvements, Mountain Stream Tap Water, Pattani Watershed, South Thailand

INTRODUCTION

Nowadays, the water demand was increasing all the time because of the increasing population, together with the advancement of science and technology, causing the country to mainly focus on industrial development. Regardless of the environment was causing the current environment to deteriorate considerably resulting in pollution in various areas such as air pollution, soil pollution, and water pollution, etc. Water sources when contaminated from sewage and waste into the source of water for consumption may cause health effects. Balo sub-district Administration Organization was a subdistrict administrative organization, one of 16 sub-district administrative organizations in Raman district, Yala province (Rangpan,

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

2015), located in the south of the district by being away from Raman district office to the south along with the Raman Civil Line Ban Bar Ploo House. The area was approximately square kilometers, or about 18,430 rai, with the following territories: the north was connected to Kayu Boko sub-district, Raman district, Yala province, the south was connected with Riang sub district, Rueso district, Narathiwat province, and the east was Talohalo sub district, Raman district. West Yala province contact with Kayubo Island, Yata sub district, Raman district, Yala province, having flat plains and mountainous areas. In the lowland area with an altitude of 20-30 meters above sea level, with an area of approximately 35 percent of the sub-district, most areas were farmland and planting fruit trees, perennials, and rubber trees Most areas of the Balo sub-district were agricultural areas (Rangpan et al., 2017; Rangpan, 2020A). The area was approximately 58.26 percent of the sub-district area. Rubber plantations, fruit orchards, and orchards that grow in the area were Wollongong and coconut. Balo sub-district Administration Organization was a government unit that used a mountain water supply system for consumption. Which was a source of water obtained from the Ai Rum Bot which was a source of water from the San Kala Khiri Mountain was a mountain in Rueso district Narathiwat province. All 7 villages in the Balo sub-district used tap water for consumption. The occupation of villagers in the Balo sub-district was mainly engaged in gardening, farming, to prevent pests and increased productivity villagers therefore used chemical fertilizers and chemicals to eradicate pests and speed up production. Resulting in chemical residues in the soil and flow into the water source that flows through the basin that was used in the water supply. Previously, villagers Balo district can consume water safely but there was an unexpected event one villager consumed tap water, causing sudden diarrhea when taken to the hospital for acknowledgment that villagers drink water with chemical contamination (Hasan, 2012). Information from interviewing waterworks officials attached to Balo Subdistrict Administration Organization proposes to have an agency to inspect the mountain water supply quality but no department came to inspect the water quality for in which the researcher proposes and will carry water to check the water quality for use in research studies and was a guideline for improving tap water quality further (Rangpan, 2020B; Rangpan, 2020C).

RESEARCH AND METHODS

In this research, the researcher used the mixed-method research methodology, which was survey research and qualitative research for the mountain water quality of Balo Subdistrict Administrative Organization, Raman district, Yala province by studying the data from the initial survey data of the Subdistrict Administration Organization. Balo Subdistrict, Raman district, Yala province, and informal interviews.

Population and Sample

It was studied water quality and guidelines for physical water quality improvement. It was the chemical and biological of mountain water supply for a period of 6 months from October 2012 to March 2013.

Research Tools

Water quality and guidelines for improving the mountain water supply quality of the Balo sub-district Administrative Organization, Raman district, Yala province had research tools as follows:

Nature of Research Tools

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

1. Test tube, size 15 mL
2. Durham tube
3. Pipettes 10 and 1 mL
4. Rubber tubes for pipette suction
5. Alcohol lamp
6. Incubator
7. Wire loop
8. Culture media
9. Distilled water for Sample Dilution
10. Lactose broth (LB) or Lauryl tryptose broth
11. Brilliant Green Lactose Bile Broth (BGB)
12. EC medium
13. Burette
14. Conical bottle
15. Beaker

How to Build a Tool

Monitor water temperature should adjust the standard of the thermometer first by

1. It was put a small piece of ice in a glass and add a little water to have more ice than water.
2. It dipped the thermometer into the glass in item 1, stir the thermometer gently which will cause the thermometer to gradually cool down.
3. Leave for 10-15 minutes.
4. Temperature measurement can read the temperature. If the reading was between 0.5 0C, the thermometer was OK. But if less than -0.5 0C or greater than+0.5 0C, check whether any other substances were contaminated or not, such as containing salt, but if verified that there are no other additives. The temperature reading was still less than -0.5 0C or greater than+0.5 0C changed the turbidity thermometer as follows.
    a. Turbidity meter using a turbidity meter
    b. Standard turbidity solutions 0-4,000 NTU or 0-7,000 NTU (depending on the capability of the equipment). The standard turbidity solutions in the laboratory had the following turbidity values:
    a) Standard turbidity solution, stray light NTU
    b) Standard turbidity solution 0 - 20 NTU
    c) Standard turbidity solution 0 - 200 NTU
    d) Standard turbidity solution 200 - 4,000 NTU

1. Water sample tubes and cloth liner
2. Distilled water
3. Beaker

Materials and Data Collection

It was studied water quality and guidelines for physical water quality improvement, the chemical and biological of mountain water supply for a period of 6 months from October, 2012 to March 2013.

Temperature

Measuring the temperature of the water was the measure of the amount of solar energy that the water receives. Including the soil and air in the surrounding area as well if the water receives more heat from the sun, the water temperature will have increased. In addition, water from the factory may also have increased the temperature of the water source. Evaporation of water at the surface of the earth can help reduce the water temperature in the surface area that was not deep. Measurement of water temperature gave insight into the patterns of changes occurring during the year. Because the water temperature in a water source will have a high influence on the amount, diversity of living organisms in that water source first.

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

Acidity – Alkalinity

By studying the acid-base measurement as follows

1. It used pH paper which will change color according to the pH value of water, when comparing with standard color bands, the approximate pH will be obtained.
2. It is used to compare colors with standard solutions with a known pH value by adding equal amounts of the indicator. This method will measure the pH more finely. Use paper and the color will last longer. But may cause errors in the case of sample watercolor.
3. Use a pH meter which had many types depending on the resolution of the desired pH value. That was generally used as alternating light and direct light, the cheap price that was used in laboratories, and the field detailed measurement form used in the laboratory**.**

How to find the pH value used by a pH meter

Tools and equipment

1. PH meter
2. Beaker

How to measure with the electrometric method was a measurement using a glass electrode. Currently, this type of instrument was used because it was convenient, fast, and effective. But there was a disadvantage that the tools are very expensive an instrument to measure the acid-base pH meter called a glass electrode works very well. The exact value was+0.1 pH unit, and most recently there was an ion analyzer or electrometer used in the Environmental Health Division which uses a combination electrode.

Method of Measurement

1. It used distilled water to clean the electrode using tissue paper to dry.
2. Adjust the instrument to the standard value according to the instructions in the device's manual with a standard solution that had a pH similar to the sample water to be measured (pH 4 and pH 7).
3. It used distilled water to wash the electrode again, dry the water.
4. Measure the acid-curd value (pH) of sample water (The sample water to be evaluated must have a temperature close to or equal to the temperature of the standard solution in item 2).

Turbidity

There were 2 methods of turbidity measurement, which are Visual Method, including Jackson Candlestick Thermometer, standard bottle, and the Nephilome rick method. Turbidity measurement using the Nephelometric Method was suitable for reading turbidity from values below 5 to high turbidity. It used the principle of comparing the light intensity that passes through the water sample. With the concentration of light passing through the standard turbidity solution if the sample water had high turbidity the light intensity that passes through will be small. The turbidity readings were in the NTU (Nephelometric Turbidity Unit) or FTU (Formazin Turbidity Unit). When collecting water samples, the turbidity analysis should be done immediately. If unable to do so, should be stored in a dark place, should not exceed 24 hours before the turbidity measurement, and shake the sample well beforehand.

Analytical methods

1. 100 ml water sample pipette (or suitable volume), put in 250 ml Erlenmeyer flask
2. Adjust the pH to range 7-10 with NaOH or $H_2SO_4$1N or phenolphthalein drops and test for acid conditions. If the sample was pink (as a base), slowly drop di H_2SO_4 until the pink disappears. If the

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

sample was colorless (acidic), slowly add di H_2SO_4 until light pink, then gradually drip di $H_2SO_4$1N until the pink disappears.
3. Add K_2CrO_4 indicator solution 1 mL (use the same amount for every sample)
4. Titration with standard 0.0141 N $AgNO_3$ to Pinkish yellow endpoint
5. Blank sample analysis like sample analysis notice that the color at the endpoint was the same.

Hardness

There were methods for finding water hardness as follows.

1. It used water samples in volumes requiring EDTA less than 15 mL. Try to complete the titration within 5 minutes.
2. 50 ml of sample water pipette into 250 mL of Erlenmeyer flask.
3. Adding 1 mL of buffer solution will give pH 10.0+0.1
4. Add a little dry powder indicator until it became reddish-purple. Then titrated with a standard EDTA solution along with stirring or shaking until magenta turns blue.

It was Chacked Coliform Bacteria and Fecal Coliform Bacteria.

How to check

1. Take the water from the tube that gave a positive presumptive test to incubate in the BGB broth by using inoculating loops in the amount of 2 loop/L tube.
2. Bring to Incubate at 35+0.5 0C for 48 hours
3. Count the amount of BGB broth produced by gas after incubation at 35-37 0C for 48 hours
4. Record the number of gas tubes in which each gas sample was generated.
5. Read to be the most probable number (MPN).

Examination of E-Coli

3-Step inspection method as follows

Presumptive Test

Methods

1. Shacked the water together and used a sterile pipette to suck 10 mL of water into the double-strength broth of Lactose broth of 3 or 5 tubes (depending on the system).
2. It used the same pipette to absorb 1 mL of water, for example, 3 or 5 in the 2nd row
3. It was used 1 mL pipette to absorb the sample water in the 3rd row, 0.1 mL. Per 3 tubes or 3 tubes (depending on the system).
4. Incubate at 35+0.5 0C for 48 hours read the results by looking at the gas generation in the Durham tube. Record the number of tubes in each row (combination of positive), take the gas tubes to test in step 2.

Confirm Test

Methods

1. Took the water from the tube that gave a positive presumptive test to incubate in the BGB broth by using inoculating loops in the amount of 2 loop/1 tube.
2. Bring to incubate at 35+0.5 0C for 48 hours.
3. Count the amount of BGB broth that produced gas after incubation at 35-37 0C for 48 hours.
4. Record the number of gas tubes in which each gas sample was generated.
5. Read to be the most probable number (MPN)**.**

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

Complete Test

Methods

1. Transfer the infection by a wire loop from the tube that had positive results in the confirm test stage on the culture plate with solid food. Endo agar Eosin methylene blue agar by moving the tip of the loopback and forth on the surface of the solid food (streak) all over the dish.
2. Bring to incubate at 35+0.5 0C for 24+2 hours with the dish upside down.
3. The colony that occurs will be magenta; the color was dark and glossy like metal or pink.
4. It was used a needle to dip the colonies separately, and clearly visible on each plate put in a Lauryl tryptose broth and a nutrient agar slant food container.
5. Incubate both infected esophagus at 35+0.5 0C for 24+2 hours. If coliform, gas was produced in a tube containing liquid Lauryl tryptose broth. No gas occurs in 24+2 hours continue to bake for 48+3 hours nutrient agar slant was to be Gram-stained and examined for bacterial microscopy.

Data analysis

The analysis of the research data was divided into 2 parts which are the analysis of quantitative and qualitative data by descriptive analysis (Descriptive) (Supang Chantawanit, 2009).

1. Data analysis methods used statistical instantiation program to calculate the result
2. Statistics used in data analysis
3. Statistics used to find the quality of tools use statistical packages to calculate the standard values of the tools and the standard settings of the tools in the scientific laboratory by calibrating all types of devices every time before use for accurate and accurate values.
4. Statistics used in data analysis.
5. Descriptive Statistic: Arithmetic Mean Standard Deviation
6. Inferential Statistic: One way ANOVA

Data Analysis Steps

Effects of land used in mountain water supply area of the Balo sub-district Administrative Organization, Raman District, Yala province.

Physical mountain water quality analyzed Chemical and biological of Balo Subdistrict Administrative Organization, Raman district, Yala province.

This studied the relationship between physical water quality and chemical water quality of mountain water supply of the Balo Subdistrict Administrative Organization, Raman district, Yala province. The results of the study found ways to improve the quality of the mountain water supply of the Balo Subdistrict Administrative Organization, Raman district, Yala province for consumption.

RESULTS

The results of land use in the area using mountain water supply of the Balo sub-district Administrative Organization, Raman district, Yala province found that the area was flat-highland and mountainous areas and use the land by rubber plantations, orchards, and orchards Study the relationship between physical and chemical water quality.

Table 1
RESULTS OF TESTING THE RELATIONSHIP BETWEEN PHYSICAL AND CHEMICAL WATER QUALITY BY PEARSON CORRELATION

Water Quality Index	Water Quality Index (Sig, r)						
	NTU	T	TDS	TSS	pH	Total Hardness as $CaCO_3$	Cl

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

NTU	-	0.965	0.84	0.062	0.469	0.082	0.596
		0.009	-0.044	0.387	-0.155	-0.362	-0.114
T	0.965	-	0.35	0.4	0.578	0.915	0.426
	0.009		-0.199	-0.18	-0.12	-0.023	-0.17
TDS	0.84	0.35	-	0.003	0.374	0.001	0.745
	-0.044	-0.199		.577**	0.19	.619**	0.07
TSS	0.062	0.4	0.003	-	0.137	0.782	0.646
	0.387	-0.18	0.577**		0.313	0.06	-0.099
pH	0.469	0.578	0.374	0.137	-	0.856	0.638
	-0.155	-0.12	0.19	0.313		0.039	0.101
Total Hardness as $CaCO_3$	0.082	0.915	0.001	0.782	0.856	-	0.762
	-0.362	-0.023	0.619**	0.06	0.039		-0.065
Cl	0.596	0.426	0.745	0.646	0.638	0.762	-
	-0.114	-0.17	0.07	-0.099	0.101	-0.065	

Table 1, the test of the relationship between physical and chemical water quality by Pearson Correlation found that TDS, TSS, and Total Hardness as CaCO3 had a significant relationship at the level of 01. With the correlation coefficient (r=0.577 **, 0.619 **) positively at a high level respectively, and when testing the regression coefficient, the Linear Regression method had the following information**.**

Table 2
RESULTS OF LINEAR REGRESSION TEST BETWEEN TDS AND TSS AND TOTAL HARDNESS AS CACO3

Water Quality Index that Studied in Relation to TDS	Coefficient			F-value	R-square	Std.err of estimate	t-value	Sig (t-prob)
	Constant	B	β_0					
TSS	-47.59	3.087	0.577	10.983	0.333	14.24	-2.05	0.003
Total Hardness as $CaCO_3$	5.637	0.329	0.619	13.646	0.383	1.36	2.54	0.001

Table 2 showed the results of the linear regression testing between TDS and TSS and Total Hardness as $CaCO_3$ at the statistical significance level 0.05. Simple linear regression analysis method it was found that TSS and Total Hardness as $CaCO_3$ had a high level of influence on TDS, TSS and Total Hardness as $CaCO_3$ (R=0.577, 0.619) respectively. Affect the change of value TDS raised at a percentage 33.3 the correlation equation was obtained from the definition, with all TSS values increased by 1 milligram per liter, as a result, the TDS increased by 3.089 units the equation between the TDS and TSS values was equal to TDS=47.59+3.087 (TSS). It was the relationship between Total Hardness as $CaCO_3$ and TDS, it was found that every Total Hardness as $CaCO_3$ increased by 1 milligram per liter, increasing of 0.329 units of TDS and resulting in a higher TDS change at the percentage of 38.3 establishing the relationship equation between the TDS value and the Total Hardness as $CaCO_3$ equals TDS=5.637+.389 (Total Hardness as $CaCO_3$).

Table 3
RESULTS OF THE MULTIPLE LINEAR RELATIONSHIPS BETWEEN TDS TSS, AND TOTAL HARDNESS AS $CACO_3$

Water Quality Index that Studied in Relation to TDS	Coefficient			F-value	R-square	Std.err of estimate	t-value	Sig (t-prob)
	Constant	B	β_0					
TSS	6.632	0.101	0.542	21.875	0.676	1.899	4.355	0.000
Total Hardness as $CaCO_3$		1.103	0.586				4.710	0.000

R=0.822

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

Table 3 showed the results of the multiple direct linear relationship test between TDS and TSS and Total Hardness as $CaCO_3$ by multiple linear regression analysis. It was found that the TSS and Total Hardness as $CaCO_3$ variables slightly influenced the TDS level (R=0.822). It resulted in a higher pH change of 21.88 percent, resulting in the equation and the meanings by all TSS values increased by 1 milligram per liter. Resulting in an increased pH of 0.101 units and all Total Hardness as $CaCO_3$ increased by 1 milligram per liter. As a result, the TDS increased by 1.103 units. It can create the relation between TDS and TSS and Total Hardness as $CaCO_3$ equal to TDS=6.632+0.101 (TSS)+1.103 (Total Hardness as $CaCO_3$). The researcher interviewed and group chats President of Balo subdistrict Administration Organization Water supply staff and the staff within the Balo sub-district Administration Organization, the villagers and the staff of the Balo sub-district Health Promotion Hospital, and guidelines for improving the quality of mountain water supply of the Balo Sub-district Administrative Organization, Raman District, Yala Province for used in consumption. Allowing the researcher to know the problem found that most of the tap water quality problems because the villagers do not have the basic knowledge. About was it. In addition, there was still a lack of cooperation between government officials, villagers in some villages in the area. No water supply yet due to a problem in contacting and communicate between villagers and staff despite being both the Sub-district Administrative Organization water supply officers and villagers According to the villagers, the following was a problem at this time, our home did not have running water. Had contacted the waterworks officer officials came to look and informed that the pipe was not difficult to install due to being on the side with the existing pipe. After that, it was quietly disappeared. We have difficulty wanting to use tap water because now using pond water and using a motor to spin the water when the power goes out, there was no water to use Roxidah (2012). We have gone to see the mentioned location, prepared equipment but because of the said area was opposite the existing pipe need more equipment and very budget, therefore, propose that the villagers come to appeal to the president of the sub-district Administration Organization themselves (Madam, 2012). We have not been contacted. Complain from the villagers once this time, thanks to the researchers who have done this research we will do the community. And continue to solve problems (President of the Sub-district Administrative Organization/20 October 2012) The result of the villagers' diarrhea, resulting in the people in the area not daring to consume tap water again, because the tap water production staff said that adding a lot of chlorine in tap water that was ready to deliver to the public because there was no knowledge of how much chlorine was added to make it safe to consume used only methods of trial and error. Another problem that was encountered was the turbidity problem in the rainy season and heavy rain, which made the water supply department unable to adjust the turbidity quality. Therefore, suggesting that the relevant parties come to give knowledge and practice methods for the tap water production officials further to correct the situation correctly due to the present still using a solution with a small number of staff, we did not have the knowledge of add calorie amount when trying to put it on trial and error. Causing villagers who drink diarrhea water to have to be sent to the hospital (Madam, 2012). It was not daring to drink tap water anymore, because there were villagers drinking tap water in the district and severe diarrhea and hospitalization from before drinking and being confident in the back, not daring to drink anymore have to buy drinking water increased expenses (Darahing, 2012). Both the water supply staff District Administrative Officer and we still lack cooperation gave knowledge in this field resulting in the said problem thanks to the researchers who came to do research on this subject. We will coordinate and cooperate to solve the problems together (Sunita, 2012). The problems discovered by officials of the Sub-district Administrative Organization found that there was still no government team that supports the budget for the purchase of water conditioning to solve turbidity problems and still lack the budget promoted the water quality development of the Sub-district

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

Administrative Organization the staff used to send the project and buy equipment to improve quality. But it was not considered for passing we went to see the proposed project and send it to the relevant government agencies in this regard but has not been determined claiming that the area was at risk do not dare to inspect the water supply production facility and improve the water quality, therefore, would like to delay the budget first. Hasan, (2012) had consulted the president of the sub-district administrative organization and a team to improve the water supply quality of our sub-district in order to have good water quality but because he lacked many other insights would like to send the team to receive some training on water quality management (Madam, 2012).

DISCUSSIONS

This was land use in the area using mountain water supply of the Balo Sub-district Administrative Organization, Raman district, Yala province, found that the area is lowland-highlands and mountainous areas, and use the land by rubber plantations, orchards, and orchards that grow, such as coconut, Wollongkong (Rangpan, 2020D), and use the area to construct a weir to produce mountain water supply for the people in the area to use and consume**.** Consistent with the research of Athisa, (2009), studied participatory community water management: a case study of Ban Suan Kluai, Kok Thong sub-district Mueang Loei District, Loei province said that the land use of the community resulting in the villagers making good use of mountain areas. Natural water sources in the area built a weir to produce and manage drinking water for the benefit of the people in the area. It also corresponds to (Madam, 2012; Sureeya, 2011), that said that the results of the use of natural land forced the swamp forests in the area can be utilized for the community, by constructing a weir and producing mountain water supply for the consumption and consumption of villagers, in addition, it also saves the cost for the villagers as well. The relationship between physical and chemical water quality of each station showed that TDS, TSS, and Total Hardness as $CaCO_3$ were significantly related at 0.01 level. Test the linear regression relationship between TDS TSS and Total Hardness as $CaCO_3$ at the statistical significance level of 0.05 using simple linear regression analyses. It was found that TSS and Total Hardness as $CaCO_3$ had a high level of influence on TDS, TSS, and Total Hardness as $CaCO_3$ (R=0.577, 0.619) respectively. Affect the change of value TDS rises at a percentage 33.3 the correlation equation was obtained from the definition, with all TSS values increased by 1 mg per liter, showed that the TDS increased by 3.089 units and obtained the equation of relation between TDS and TSS equal to TDS=47.59+3.087 (TSS). The relationship between Total Hardness as $CaCO_3$ and TDS showed that all Total Hardness as $CaCO_3$ increased 1 milligram per liter, indicating that the TDS increased by.329 units and resulted in high TDS changes. Up at 38.3 percent. The relationship equation between TDS and Total Hardness as $CaCO_3$ was equal to TDS=5.637+0.389 (Total Hardness as $CaCO_3$). The guidelines for improving the quality of the mountain water supply of Balo Sub-district Administrative Organization, Raman district, Yala province for using and consumption, as well as the administrators of the Balo sub-district administration, lacked cooperation and lacked consistent communication. Consistent with Madam, (2012) that people and officials lacked good Communication mismatch and have different understanding and different ways resulting in the above problems. It also corresponds to H. Niyamae (Hasan, 2012) and staff members still did not communicate. There was no notification to the Subdistrict Administration Organization officials clearly acknowledged, causing such problems, and the Subdistrict Administration Organization and staff of the Balo Sub-district Health Promotion Hospital still lacking cooperation in providing knowledge and public relations about the benefits and disadvantages of poor-quality water intake. Because the villagers still did not have knowledge about water quality about both you

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

and the penalty if consuming unqualified water. Consistent with Sureeya, that said both the officials and the Subdistrict Administration Organization no promotion and providing knowledge on the quality of drinking tap water both for you and for the harm what's up the villagers consume as they wish, think that the tap water is clean, clear water can drink enough. The Balo sub-district Administration Organization still lacks government support and related agencies to support the budget for the development of mountain water supply quality. This was consistent with H. Niyamae (Hasan, 2012) said that the Subdistrict Administration Organization lacked the budget and lacked financial support from the government and related agencies in the development and improvement of mountain water quality to improve quality, which most problems of water supply in the mountains of Balo were the turbidity side there was a lot of sediment, which was still a problem that has remained to these days.

CONCLUSION

The results of land use in the area using mountain water supply of the Balo Subdistrict Administrative Organization, Raman district, Yala province found that the area was flat-highland and mountainous areas and use the land by rubber plantations, and orchards. Differences in the mountain water supply quality of the Balo Subdistrict Administration Organization each station studied on physical and chemical water quality, found that the difference in physical turbidity quality (Turbidity=NTU) has the highest mean the village 4 stations 3, the location was a single house was equal to 3.92 NTU and have the lowest values the village 2 stations 2 the location was a single house with a value of 0.56 NTU. Temperature has the highest mean value the village 5 station 1, the location was adjacent to the community house which was equal to 35.17 degrees Celsius. The lowest value was the village 6 station 1 and the village 6 station 2, the locations are community sources. The adjacent house was equal to 33.50 degrees Celsius. Total Dissolved Solids (TDS) (mg/L) had the highest mean in the village 7 stations 1, the location was a community source. The adjoining houses were equal to 28.31 mg/L and had the lowest mean in the village 5 stations 1, the place was a community source. The adjacent house was equal to 16.04 mg/L. Total Suspended Solids (TSS) (mg/L) had the highest mean value the village 7 stations 3, the locations were adjoining community houses with a value of 65.99 mg/L and the lowest the village 1 station 2. That was a community source the adjacent house was equal to 8.52 mg/L. As for the chemical difference, it was found that the acid-base (pH) had the highest mean in the village 5 stations 1, places were adjoining community houses at 6.54 and the lowest the village 1 station 2, it was a single house with a value of 5.68. Total Hardness as $CaCO_3$ (mg/L had the highest mean value the village 4 stations 3 we're adjoining community houses equal to 30.43 mg/L and the lowest the village 7 stations 2. That was a community source the adjacent house was equal to 21.12 mg/L. Chloride (Cl (mg/L) had the highest mean the village 3 and village 1 were the adjoining community source which was equal to 16.25 mg/L and the lowest average was the village 5 station 1 it was a community source the adjacent house was equal to 10.45 mg/L. The test of the relation between the physical and chemical water quality of each station showed that the TDS, TSS, and Total Hardness as $CaCO_3$ had a significant relationship at the level of 01. The results of the study to find ways to improve the quality of the mountain water supply of the Balo Sub-district Administrative Organization, Raman district, Yala province for use in consumption and found that the villagers who produce the water supply as well as the administrators of the Balo subdistrict still lacking cooperation lack of consistent communication and the sub-district administration organization with the staff of Balo health promotion hospital still lacking cooperation in providing knowledge and public relations about the benefits and disadvantages of poor

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.

quality water intake. Because the villagers still did not have knowledge about water quality about both you and the penalty if consuming unqualified water the Balo Sub-district Administration Organization still lacks government support and related agencies to support the budget for the development of mountain water supply quality.

ACKNOWLEDGEMENTS

This research was to study the water quality and the improvement of the mountain water supply quality of Balo Subdistrict to Administrative Organization, Raman District, Yala Province. The researcher would like to thank the people involved in the Balo Sub-district Administration Organization as well as citizens and water supply personnel President of Balo Subdistrict Administration Organization and the staff of Balo Sub-district Health Promoting Hospital and Yala Rajabhat University that provided research assistance. However, Associate Professor Dr. Vichit Rangpan, he is corresponding, his e-mail; vichit39@gmail.com.

REFERENCES

Athisa, D. (2009). *Community water management with participatory*: A case study of Ban Suan Kluai. Kok Thong Subdistrict, Mueang Loei District, Loei province social sciences for loei Rajabhat University.

Darahing, S. (2012). Villagers Balo sub district, Raman District, Yala Province.

Hasan, N. (2012). *Civil worker bolo sub district administrative organization*. Raman District Yala province, 2012, August 13.

Madam, T. (2012). *Water supply officer*. Balo Sub district Administration Organization Raman District, Yala Province.

Rangpan, V. (2015). Conservation of environment and natural resources on Pattani Watershed South Thailand. In proceedings of the international conference on biodiversity and conservation (ICBC 2015), Malaysia. 2015, 136-150.

Rangpan, V. (2020B). Guidelines for sustainable ecosystem development at the phrayasai dam. Narathiwat Province Southern Thailand (The 3rd NICE, 2020), Thailand. 2020 b, 479-488.

Rangpan, V., Matchimapiro, D., Treepaiboon, N., Thongmak, N., & Nujan, D. (2017). The local scientific lesson for conservation and utilizing biological diversity in the Pattani Watershed. *Journal of Rangsit University: Teaching & Learning*, *11*(2), 123-132. GoogleScholar

Rangpan, V. (2020A). Guidelines for sustainable ecosystem development at sirindhorn waterfall. Narathiwat Province Southern Thailand (The 3rd NICE, 2020), Thailand, 2020a, 390-400.

Rangpan, V. (2020C). Guidelines for sustainable ecosystem development at Wasukri Beach. Pattani Province Southern Thailand (The 3rd NICE, 2020), Thailand, 2020c, 587-598.

Rangpan, V. (2020D). Guidelines for sustainable ecosystem development in the tachi cape area pattani province Southern Thailand (The 3rd NICE, 2020), Thailand. 2020 e, 156-179.

Rosidet, J.L. (2012). Villagers ban bal sub district. Raman District, Yala Province.

Sunita, K. (2012). (Personnel at the tambon health promoting hospital, A. Muang Raman District, Yala Province2012, May 20).

Sureeya, T. (2011). Villagers. Ban Balo Subdistrict, Raman District, Yala Province.

Received: 29-Nov-2022, Manuscript No. JMIDS-22- 10261; **Editor assigned:** 01- Dec -2022, PreQC No. JMIDS-22-10261 (PQ); **Reviewed:** 06- Dec -2022, QC No. JMIDS-22-10261; **Revised:** 15-Dec-2022, Manuscript No. JMIDS-22-10261 (R); **Published:** 04-Jan-2022

Citation Information: Rangpan, V., & Khaemoh, R. (2022). The relationship between water quality and improvements of mountain stream tap water in Balo sub district administrative organization Raman district Yala province Pattani watershed South Thailand. *Journal of Management Information and Decision Sciences, 25*(S2), 1-11.