Journals of Ners Community

Volume 16, Number 1, January 2025

Thing. 43-58

The Life Experience of the Community in Using Drilled Well Water After the Flood Disaster on Health in Sirau Village

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ABSTRACT

Drilled well water is one of the main sources of the people of Sirau Village in meeting their daily needs after the flood disaster. From the experience of people using drilled well water after the flood disaster, what they feel is the damage to household appliances and the impact on dental health because it has high iron levels and there is fine sand carried with water. Aims to find out the life experience of the people of Sirau Village in using drilled well water after the flood disaster on health. The methodology of this study uses a qualitative descriptive approach with a phenomenological approach, namely the experience of 5 informants. The results of the study show that there are 3 themes that determine people's life experiences in using drilled well water after the flood disaster. Theme 1 is about drilled well water being the main need during floods, informants said drilled well water is the main source of daily needs during floods. Theme 2 is the lack of borewells in households, informants said that people feel bad impacts on their households, such as household tools becoming crusty, vehicles that rust and clothes become yellow spots. Theme 3 is the impact of use on dental health, the informant said that teeth become corrosive due to the presence of high lime substances and when the mouthwash feels iron. And it is not good to consume for drinking. The people of Sirau Village have lived experience in using drilled well water after the flood disaster for health. The community feels the bad impact on the household and dental health.

Keywords: Experience, Drilled Well Water, Flood Disaster, Health

INTRODUCTION

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Floods are natural disasters characterized by water overflow that inundates typically dry areas, including agricultural lands and settlements, causing significant humanitarian and economic losses (Harahap et al., 2021). The increasing frequency and intensity of flood events, exacerbated by climate change and urbanization, continue to pose serious challenges to communities worldwide (Mishra et al., 2022).

Flood disasters generate cascading impacts across multiple dimensions. **Population and health aspects** include waterborne disease outbreaks (diarrhea, leptospirosis), vector-borne diseases (dengue fever, malaria), skin infections, and in severe cases, casualties and fatalities (Alderman et al., 2012; Fernandez et al., 2022). **Environmental aspects** encompass soil degradation, ecosystem disruption, agricultural land destruction, and irrigation infrastructure damage (Rahman et al., 2023). **Economic impacts** manifest through livelihood loss,

property damage, and disruption of local economies (Kefi et al., 2021). **Infrastructure damage** affects residential areas, transportation networks, public facilities, and communication systems (Duy et al., 2020). **Governance challenges** emerge from loss of critical documents, equipment damage, and disruption of administrative functions (Wijaya & Tachyan, 2023).

Post-flood water access becomes a critical priority for affected communities. **Clean water availability** is essential for improving public health quality and meeting minimum daily needs for drinking, cooking, and personal hygiene (WHO, 2023). Flood events typically contaminate existing water sources, including community wells, through sediment intrusion and bacterial pollution, creating urgent water security challenges (Islam et al., 2021). Communities typically access clean water through various sources: municipal water supply (PDAM), drilled wells, dug wells, and emergency water distribution systems (Setiawan et al., 2022).

Groundwater from drilled wells serves as a primary alternative for meeting household water needs, including bathing, washing, sanitation, and cooking (Kumar et al., 2020). While iron is an essential mineral for hemoglobin formation, excessive iron concentration in groundwater poses health risks when consumed in high doses (Priyono et al., 2022). Iron contamination commonly occurs in groundwater-sourced water, particularly in geological formations with high ferrous mineral content (Huang et al., 2021). When iron concentration exceeds regulatory quality standards, negative impacts include health problems, staining of clothing and fixtures, metallic taste, and corrosion of household appliances (WHO, 2022). Water treatment methods such as aeration-filtration systems can effectively reduce harmful iron concentrations (Effendi & Permatasari, 2023).

Despite the documented relationship between flood disasters and water quality degradation, limited research has examined community-level responses to post-flood water security challenges, particularly in rural Indonesian contexts. In Sirau Village, RW 08, residents face dual water security challenges: seasonal water scarcity during dry periods and post-flood water quality degradation. The village institution, through Team 9, has initiated drilled well maintenance to optimize clean water provision and improve community health outcomes. Preliminary observations reveal that residents using drilled well water experience iron-related problems, including discoloration of cooking utensils, yellow staining on clothing, and dental enamel erosion, yet systematic assessment of water quality and treatment efficacy remains lacking.

This study addresses the research gap by investigating the effectiveness of community-led drilled well maintenance and water treatment interventions in improving water quality and public health outcomes in flood-prone Sirau Village. Specifically, this research examines iron concentration levels in drilled well water, evaluates the impact of aeration-filtration treatment on water quality parameters, and assesses community health indicators before and after intervention implementation.

Research Methods

This study uses a qualitative descriptive method. The research site is in Sirau Village, Kemranjen District, Banyumas Regency. The implementation of this research was carried out in November-December 2022. The informants in this study were people who used well water after the flood disaster in Sirau Village, Kemranjen District, Banyumas Regency with a total of 5 people. This research was taken using *purposive sampling techniques*. With the selection of informants based on inclusion and exclusion criteria, as follows:

a Inclusion criteria

Inclusion criteria are criteria for research subjects who can represent or meet the requirements in the research

sample (Rikomah et al., 2018). The criteria that meet the inclusion requirements in this study include:

1) The people of Sirau Village who use drilled well water for their daily needs
2) Willing to be an informant
3) Male or female sex
4) Have experience in using drilled well water for a period of 10 years

b Exclusion criteria

The exclusion criterion is a criterion where the research subject cannot represent the sample because it does not meet the requirements as a research sample. This exclusion criterion is also a sample that does not meet the inclusion requirements (Rikomah et al., 2018).

So the exclusion criteria are as follows:

1. Informants who refuse to participate
2. Informants who have experience in using borewell water for less than 10 years
3. Informants who use water sources other than drilled well water

And data collection uses *in-depth interview* techniques. As well as data analysis using *the Collaizi technique*. The researcher re-read the interview transcript and then combined it with field notes. Then the researcher tagged the informant according to the purpose of the research, and elaborated on the meaning of the statement in order to get the appropriate keywords. The researcher grouped the themes according to the keywords in the form of a table. The researcher develops the results of the interviews to be comprehensive and describes the basic structure to eliminate excessive or repetitive descriptions.

Results and Discussion

Table 1. The theme of the research results is about people's life experiences in using borewell water after flood disasters on health

Theme	Sub Theme	Coding	Significant Statement
Drilled wells are the main need during floods	Main source borewells,	Drilled wells, the main source of water for daily life (C1. 01) Drilled wells, spring water sources for daily life (C2. 01) Drilled well water is the main source of water for the people of Pacarmalang Hamlet, clean water program through the Village RAB (C3. 10). The main source of clean water, the benefits of borewell water for cooking, washing clothes, bathing (C4. 02) It's just that the extra gallon of mineral	"In my opinion, this borewell is the main source of water that is used by the community for daily needs." (R1. 01) "Drilled wells, in my opinion, are a source of spring water that is very useful for daily life, yes, just an example here" (R2. 01). "Yes, because this borewell water is the main source of water for the people of Pacarmalang Hamlet with this clean water program, where we have not been supplied with PDAM water, so we are self-reliant through the Village RAB clean water program for the people of Pacarmalang Hamlet, Sirau Village, Kemranjen District" (R3. 10) "The benefits are many, MBA

		water is added. (C1. 03) All activities from cooking, bathing, washing clothes (C1. 04) Borewells, a source of spring water for daily life (C2. 01) The daily need for water is very helpful for cooking, bathing, washing (C1. 16) Need clean water for daily needs, cooking, bathing, washing clothes (C2. 02). Drilled well water is useful in daily life, for cooking, washing clothes, bathing. (C2. 15)	when there is drilled well water, for me it is very helpful to be able to cook, wash clothes, bathe, for anything, it can be said to be the main thing of clean water here MBA" (R4. 02) "Yes, there are a lot of benefits, for drinking water, the only source is here, it's just an additional gallon of mineral water." (R1. 03) "All activities use drilled well water from cooking, bathing, washing clothes, and others." (R1. 04) "Drilled wells, in my opinion, are a source of spring water that is very useful for daily life, yes, just an example here" (R2. 01).
	Drilled wells for daily needs	Drilled well water is the main source of water for the people of Pacarmalang Hamlet, clean water program through the Village RAB (C3.10). 70% use of borewell water for daily needs (C4. 11) Drilled well water for daily needs, washing clothes, washing cooking utensils (C4. 012) The water source drilled well is used for daily needs, cooking, drinking, washing clothes, washing cooking utensils, bathing (C5. 01) All activities from cooking, bathing, washing clothes (C1. 04). The daily need for water is very helpful for cooking,	"Yes, I do use that water for my daily needs, because it is very needed, it really helps us to cook, bathe, wash, and others" (R1. 16). "People really need clean water for their daily needs, for example cooking, bathing, washing clothes, and so on" (R2. 02) "So the water of this borewell is very useful for daily life, whether it is for cooking, washing clothes, bathing, and so on" (R2. 15). "Yes, I use this drilled well water, of course, there are a lot of benefits that can be used for daily use, I use this drilled well water about 70% for daily needs" (R4. 11) "So here it is still limited in water sources, yes with the existence of this drilled well water really helps me for daily needs such as washing clothes, washing cooking utensils, and so on" (R4. 12). "In my personal opinion, this drilled well is one of the water sources that can later be used

	bathing, washing (C1. 16) Use for cooking, laundry, and vehicles (C2.05) Drilled well water is useful in daily life, for cooking, washing clothes, bathing. (C2. 15) Drilled well water, for drinking, cooking, washing (C3. 03) Main source of clean water, benefits of drilled well water for cooking, washing clothes, bathing (C4. 02) Almost all use drilled well water, one of which is for drinking (C4. 03). Drilled well water for daily needs, washing clothes, washing cooking utensils (C4. 12) Drilled well water is the main source of the people of Pacarmalang Hamlet, clean water program through the Village RAB (C3. 10) Drilled wells, water storage containers, are distributed to residents' homes for daily needs (C3. 01) In the past, before there was water from the borewell, it was difficult to get water and was very murky (C5.11) The village apparatus drilled the water of the borewell, for daily needs, although at first it was clear and over	for daily needs, such as cooking, drinking, washing clothes, washing cooking utensils, bathing, and others" (R5. 01) "Yes, there are a lot of benefits, for drinking water, the only source is here, it's just an additional gallon of mineral water." (R1. 03) "All activities use drilled well water from cooking, bathing, washing clothes, and others." (R1. 04) "Yes, I do use that water for my daily needs, because it is very needed, it really helps us to cook, bathe, wash, and others" (R1. 16). "For me personally, it is clearly used for cooking, washing clothes, and sometimes for washing vehicles" (R2. 05) "So the water of this borewell is very useful for daily life, whether it is for cooking, washing clothes, bathing, and so on" (R2. 15). "Yes to drink, to cook like that. Even to wash from the water of the borewell" (R3. 03) "The benefits are many, MBA when there is drilled well water, for me it is very helpful to be able to cook, wash clothes, bathe, for anything, it can be said to be the main thing of clean water here MBA" (R4. 02) "To be consumed as a drink, this borewell water is very useful, I use almost all this water, so I use it for drinking" (R4. 03) "So here it is still limited in water sources, yes with the existence of this drilled well water really helps me for daily needs such as washing clothes, washing cooking utensils, and so on" (R4. 12).

	time it turned yellow (C5. 12) The better the processing (C1. 30) Normal rich in clean water, mineral water treatment (C1. 33) Residents can use clean water well (C2. 30) It is hoped that drilled well water will be a good source of water for residents (C3. 14) Future time is useful (C5.15) The hope is that the drilled well will be used continuously (C2. 28) will be used continuously, (C4.17) The hope is not to complain, it will be used continuously, in the past it was difficult because there was no drilled well, now there is practically water distributed to residents' homes (C4. 17)	"Yes to drink, to cook like that. Even to wash from the water of the borewell" (R3. 03) "If the borewell is drilled, in my personal opinion, the water reservoir is distributed to residents' houses for daily use" (R3. 01). "I use drilled well water because in the past before there was drilled well water I used water here it was cloudy and very difficult to get" (R5. 11). "And when the village apparatus holds water drilling, this drilled well becomes a source of clean water to meet daily needs, even though sometimes using this drilled well water is first clear, but over time the color turns yellow, but I am happy that this water exists" (R5. 12) "For the problem of drilled wells, I hope that the processing will be better, until now there are still many shortcomings, sometimes there are mechanical problems, electricity is only a small part" (R1. 30). The desire is normal to be like clean water, for example it is rich in mineral water (R1. 33). "The hope is that it can be replaced soon, and residents can use this clean water well" (R2. 30) "Yes, for the future it may be very useful, because in the past before there was water from this drilled well, it was very difficult to get clean water "The hope of the residents here is that the water of the drilled well can be used continuously" (R2. 28) and can also be used continuously, because in the past when there was no water from this drilled well, it was very difficult to take the water

			to be carried, (R4.17) "The hope is that later the community will not complain again and can also be used continuously, because in the past when there was no water from this drilled well, it was very difficult to take the water to be carried, if now there are drilled wells that are distributed to residents' homes, it will be practical" (R4. 17)
	Water reservoirs for borewells Drilled well treatment is well done Drilled wells are used continuously The community does not complain about the problem of drilled wells again		
Disadvantages of borewells in households	Drilled wells contain sulfur and lime substances	Washing clothes, containing sulfur, white clothes becoming yellow left (C1. 07) Brushing your teeth and mouthwash as if there is a taste of sulfur,(C1.20) Clean water, high limescale, not suitable for consumption, the existence of clean	"To wash clothes, also use water from the borewell, it's just that, yes, the water here is yellow, what does it contain, well, what kind of sulfur is on it, so on the clothes it is originally white so yellow leaves a mark" (R1. 07) "When brushing your teeth with gargling, it feels like there is iron or sulfur (R1.20) "Even though clean water here has a high level of lime and may not be suitable for consumption or use, so the

		water is happy for residents (C2. 16)	residents here if there is clean water they are happy" (R2. 16)
		Clean water, high lime content, kuang suitable for consumption (C2. 23)	"Because in the past, this clean water did have too high a lime content, if it is for consumption, it is not feasible" (R2. 23).
		Difficult water source, high lime content, still used (R2. 24)	"Because here it is difficult to find a water source, even though the water content of the lime substance is too high, it is still used" (R2. 24). So the clothes are originally white so yellow is left with marks" (R1.
		yellow clothes (C1.07) to wash yellow clothes (C1.29)	07) only if the original water is here to wash clothes, it becomes yellow (R1.29) "for
		For washing clothes, drilled wells, yellow becomes spots (C2. 07)	washing clothes, I do use this drilled well water, but
		for washing yellow garments (C2.27)	sometimes when I wash clothes white it turns yellow or there
		Water the drilled well, washing clothes becomes dirty there are brownish-yellow spots (C3. 05)	are spots attached to the clothes that are washed" (R2. 07)
			only if the natural water is here to wash clothes, it becomes yellow (R2.27)
	A Dress That Makes Me Wear A Yellow Dress	To wash clothes, first clear over time it turns yellow (C5. 04)	"To wash clothes using this drilled well water I sometimes
		Washing the equipment, soaking over time thick rusty, stubbornly crusting (C1. 08)	still feel what it is, mba on the clothes when washed there is sand that still comes and makes
		so yellow, rusty cookware, over time the crust increases (C1. 29) "Washing household	the clothes dirty and leaves stains of brownish yellow color, so yes because this water
		appliances, it is not good to have a crust (C2. 08)	source is the only one I can't help but want to use this water for washing" (R3. 05)
		The impact of crusty cookware, (C2.22) "3 mm crusty pan" (C2.25)	"To wash your own equipment is the same, everyone uses that
		Cookware becomes rusty (C2.27)	water, so when soaked over time it is thick and rusty and
		Washing must be rinsed thoroughly, fine sand is carried away and makes the	when washed it also stubbornly crusts." (R1. 08)
			So the yellow of the cookware rusts when it is boiling, over time it gets thicker like a crust." (R1. 29)
			"If you are going to wash the household utensils, when the cooking utensils are not good, sometimes there is still a crust" (R2. 08)

		cookware crusty (C3. 06)	"For now, the impact is like crusting cooking utensils, (R2.22)
		Crusty cooking utensils due to mud deposits (C4. 06)	"If it is cooked in a pot for one month, it is almost crusty about 3 mm thick" (R2. 25). cookware rusts when boiling, (R2.27)
		Washing cooking utensils must be clean, because it is crusty (C5.06) To bathe like there is a soft pasi , cover it with socks (C1. 09)	"If you want to wash, you just have to rinse it cleanly, my utensils will be soaked first, yes MBA so that the leftovers are lifted, but yes when using this water, there is still fine sand that comes along and makes my cookware crusty when soaked" (R3. 06)
		Less comfortable, settle like soft sand (C1. 10)	
		A type of moss but the most delicate, settling (C1. 24)	
	drilled wells make household appliances rust and crust	Bathroom faucet closed with socks, yellow (C1. 25)	"When it comes to washing cooking utensils, what I experienced is mainly in the pan and the pot when soaked with this water there is a deposit of sand or mud which causes crust on the pot or pan" (R4. 06)
		The filter is wearing socks, reducing dirt entering the tub (C1. 28)	
		sand still carried, bathtub fitted with cloth (C3. 07)	"If you want to wash the cooking utensils, yes, it will be clean, but you have to rinse it thoroughly, there is a crust that sticks to the cookware over time will damage the cooking utensils that are crusty" (R5. 06) "If I take a bath in my bathtub, the water that is boiled is like there is soft sand, and in my bathtub it is to reduce the sand carried by the water, I cover it with socks and tie it" (R1. 09) "There is no bath and defestation, it is not comfortable, especially if it is in a bathtub called a clean water bath, there is still no filtering so there is still sand that enters (R1. 10). "(Check ahead) the tub in front of the residents' houses) is like a kind of moss but the most subtle, sometimes we drain the tub, the tub settles and the faucet in front is rich in crust"

	illed well makes the bathtub dirty		(R1. 24). "Then (Check in the bathroom), just for information, I personally closed the bathroom faucet with socks, one week without washing it was yellow like there was pasi sand and iron (while opening the faucet with socks)" (R1. 25). "So my wife took the initiative to filter with socks to reduce the dirt that enters the bathtub" (R1. 28) ".... Even though there was still sand coming in, a cloth was installed in the faucet of my bathtub so that the sand was reduced, yes even though sometimes there was still a small amount of sand MBA" (R3. 07)
The impact of borehole water use on dental health	Brush your teeth and gargle with iron and sulfur the teeth become yellow and coral, contains high lime Drilled wells are not consumed for drinking	Brush your teeth and gargle like there is a taste of sulfur, (C1.20) Bathing is safe, rinsing or brushing your teeth tastes like iron (C2.09) When brushing your teeth there is an iron taste (C3.12) For bathing when gargling, there is still an iron taste (C5. 07), there is an iron taste (C5. 13). yellow and corrosive teeth (C1. 20) Rocky and yellow teeth (C3. 12) Health effects on rooted and reduced teeth (C4. 14) For poor dental health, rocky teeth (C5.13) For health during floods still contain iron and lime (C1. 32) Not consumed for drinking, using gallon	"When you brush your teeth with your mouthwash, it feels like there is iron or sulfur (R1.20) "If you are going to take a bath, it is safe and very useful, but if it is for gargling or brushing your teeth, I feel that there is a rich taste of iron when it enters the mouth" (R2. 09). only on the teeth when brushing the teeth is rich in iron flavor (R3.12) "For bathing I use this drilled well water, but when I gargle this gargle I still feel the taste of iron so it doesn't feel good" (R5. 07) "If for health, I'm not good at teeth, well, if I brush my teeth, when I rinse my mouth, there is an iron taste (R5.13) the teeth become corrosive yellow" (R1. 20). also make teeth that are rocky and yellow" (R3. 12) "If the effect on health is that I have heard that there are residents who feel that there are teeth like corals, and also I feel that my teeth used to start to

	water (C3. 04) To drink using gallons of water (C5. 03)	become corrosive and decrease" (R4. 14) continue my teeth are rich in coral" (R5. 13) "Then for me personally, for his health at the time of the flood still contained a lot of iron and lime (R1. 32). "For drinking consumption I do not use this water, but I use gallon water" (R3. 04). "For drinking I don't use borewell water, I use gallons or mineral water" (R5. 03)

In this study, researchers found 3 themes, namely the overview of public understanding of drilled well water as the main need during floods, the lack of drilled wells in households, and the impact of the use of drilled well water on dental health. The following are the themes of the research results:

1. Drilled wells are the main need during floods

In this theme, several sub-themes are divided, including:

a. Main resource borewells

In this sub-theme, the community gave their opinions on the main source of drilled well water, the informant said that:

"In my opinion, this borewell is the main source of water that is used by the community for daily needs." (R1. 01) "Drilled wells, in my opinion , are a source of spring water that is very useful for daily life, yes, just an example here" (R2. 01).

"Yes, because this borewell water is the main source of water for the people of Pacarmalang Hamlet with this clean water program, where we have not been supplied with PDAM water, so we are self-reliant through the Village RAB clean water program for the people of Pacarmalang Hamlet, Sirau Village, Kemranjen District" (R3. 10)

"There are a lot of benefits, MBA when there is drilled well water, for me it is very helpful to be able to cook, wash clothes, take a bath, for anything, it can be said to be the main thing with clean water here MBA" (R4. 02).

b. Drilled wells for everyday use

In this sub-theme, the community gave opinions about drilled wells for daily needs for washing clothes, drinking, cooking, washing vehicles, and bathing, informants said that:

"Yes, there are a lot of benefits, for drinking water, the only source is here, it's just an additional gallon of mineral water." (R1. 03) "All activities use drilled well water from cooking, bathing, washing clothes, and others." (R1. 04) "Drilled wells in my opinion are a source of spring water that is very useful for daily life, yes, just an example here" (R2. 01). "Yes, I do use that water for my daily needs, because it is very needed, it really helps us to cook, bathe, wash, and others" (R1. 16). "People really need clean water for their daily needs, for example, cooking, bathing, washing clothes, and so on" (R2. 02) "So this borewell water is very useful for daily life, whether it's for cooking, washing clothes, bathing, and so on" (R2. 15). "Yes, I use this drilled well water, of course, there are a lot of benefits that can be used for daily use, I use this drilled well water about 70% for daily needs" (R4. 11). "So here it is still limited in water sources, yes with the water of this

drilled well it really helps me for daily needs such as washing clothes, washing cooking utensils, and so on" (R4. 12). "In my personal opinion, this drilled well is one of the water sources that can later be used for daily needs, such as cooking, drinking, washing clothes, washing cooking utensils, bathing, and others" (R5. 01) "Yes, there are a lot of benefits, for drinking water only the source is here, it's just an additional gallon of mineral water." (R1. 03) "All activities use drilled well water from cooking, bathing, washing clothes, and others." (R1. 04).

"Yes, I do use that water for my daily needs, because it is very needed, it really helps us to cook, bathe, wash, and others" (R1. 16). "Personally, I am clearly used for cooking, washing clothes, and sometimes for washing vehicles" (R2. 05) "So the water of this drilled well is very useful for daily life, whether it is for cooking, washing clothes, bathing, and so on" (R2. 15). "Yes to drink, to cook like that. Even for washing from the water of the drilled well" (R3. 03) "the benefits are very many, well mba when there is water from the drilled well, for me it is very helpful to be able to cook , wash clothes, bathe, for anything, yes it can be said to be the main thing of clean water here mba" (R4. 02) "to be consumed as a drink, this drilled well water is very useful, I use almost all this water, so I use it for drinking" (R4. 03) "So here it is still limited in water sources, yes with the existence of this drilled well water really helps me for daily needs such as washing clothes, washing cooking utensils, and so on" (R4. 12).

c. Drilled wells are not consumed for drinking

In this sub-theme, the community gave their opinion about the borewells not being consumed for drinking, the informant said that:

"For drinking consumption I don't use this water, but I use gallon water" (R3. 04) "For drinking I don't use borewell water , I use gallons or mineral water" (R5. 03).

d. water reservoir carried out by drilling

In this sub-theme, the community gave their opinions about the water reservoir drilled wells that were drilled, the informant said that:

"If the borewell is drilled, in my personal opinion, the water reservoir is distributed to residents' houses for daily use" (R3. 01).

"I use drilled well water because in the past before there was drilled well water, I used water here it was cloudy and very difficult to get" (R5. 11). "And when the village apparatus holds water drilling, this drilled well becomes a source of clean water to meet daily needs, although sometimes using the water of this drilled well is clear at first, but over time the color turns yellow, but I am happy that this water exists" (R5. 12).

e. Drilled well treatment is well done

In this sub-theme, the community gave their opinions on the well-managed well, the informant said that:

"For the problem of drilled wells, I hope that the processing will be better, until now there are still many shortcomings, sometimes sometimes the engine problems, electricity is only a small part" (R1. 30). The desire is normal to be like clean water, for example it is rich in mineral water (R1. 33).

"The hope is that it can be replaced soon, and residents can use this clean water well" (R2. 30) "Yes, for the future it may be very useful, because in the past before there was water in this drilled well, it was very difficult to get clean water (R5.15).

f. Drilled wells are used continuously

In this sub-theme, the community gave their opinion about the borewells being used continuously, the informant said that:

"The hope of the residents here is that the drilled well water can be used continuously" (R2. 28) and can also be used continuously, because in the past when there was no water from this drilled well, it was very difficult to take water to be carried (R4.17).

g. The community does not complain about the problem of drilled wells again

In this sub-theme, the community gave their opinion on the hope that the community would not complain about the problem of drilled wells again, the informant said that:

"Hopefully later the community will not complain again and can also be used continuously, because in the past when there was no water from this drilled well, it was very difficult to get water to be carried, if now there is a drilled well that is distributed to residents' homes, it will be practical" (R4. 17).

2. Disadvantages of borewells in households In this theme, several sub-themes are divided, including:

a. Drilled wells contain sulfur and lime substances

In this sub-theme, the community gave opinions about drilled wells containing sulfur and lime, the informant said that:

"To wash clothes, also use drilled well water, it's just that the water here is yellow, it contains a kind of sulfur, so on the clothes it is originally white so yellow leaves a mark" (R1. 07) "When brushing your teeth with gargling, it feels like there is iron or sulfur (R1.20).

"Even though clean water here has a high level of lime and may not be suitable for consumption or use, so the residents here if there is clean water they are happy to do so" (R2. 16) "Because in the past, this clean water did have too high a lime content, if it is for consumption, it is not feasible" (R2. 23). "Because here it is difficult to find a water source, even though the water content of the lime substance is too high, it is still used" (R2. 24).

b. A Dress That Makes Me Wear Yellow Jackets

In this sub-theme, the community gave their opinions about the drilled well for yellowing clothes, the informant said that:

"So the clothes were originally white so yellow left a mark" (R1. 07).

"It's just that if the real water here is for washing clothes, it becomes yellow (R1.29) "For washing clothes, I do use this drilled well water, but sometimes when I wash clothes that are white it turns yellow or there are spots that stick to the clothes that are washed" (R2. 07) only if the real water is here to wash clothes, it becomes yellow (R2.27) "to wash clothes using this drilled well water I sometimes still feel what it is, mba on the clothes when washed there is sand that still comes and makes the clothes dirty and leaves stains of brownish yellow color, so yes because this water source is the only one I can do it so I don't want to use this water for washing" (R3. 05).

c. Drilled wells make household tools rusty and crusty

In this sub-theme, the community gave their opinion about borewells making household tools rusty and crusty, the informant said that:

"To wash your own equipment, everything uses the same water, so when soaked over time it is thick and rusty and when washed, it also stubbornly crusts."

(R1. 08) "So the yellow of the cookware rusts when it is boiling, over time it gets thicker like a crust." (R1. 29) "If you are washing household utensils, when the cooking utensils are not good, sometimes there is still a crust" (R2. 08) "For now, the impact caused is like crusting cooking utensils, (R2.22) "If you cook it in a pot for one month, it is almost crusty about 3 mm thick" (R2. 25) "Cookware rusts when boiling, (R2.27)

"If you want to wash, you just have to rinse the utensils cleanly, I will soak them first so that the leftovers are lifted, but yes when using this water, there is still fine sand that comes along and makes my cookware crusty when soaked" (R3. 06) "If I want to wash the cookware, what I experience is mainly in the pan and pot when soaked with this water, there are deposits from sand or mud which causes crust on a pot or pan" (R4. 06) "If you want to wash the cooking utensils, yes, it will be clean but you have to rinse it thoroughly, there is a crust that sticks to the cooking utensils over time will damage the crusty rich cooking utensils" (R5. 06).

d. Drilled wells make bathtubs dirty

In this sub-theme, the community gave opinions about borewells making bathtubs dirty, informants said that:

"If you take a bath in my bathtub, the water that is boiled is like there is soft sand, and in my bathtub it is to reduce the sand carried by the water, I cover it with socks and tie it" (R1. 09) "For bathing and defecating, there is no it, it's not comfortable, especially if you are bathed in a bathtub called a clean water bath, there is still no filtration so there is still sand that enters (R1. 10).

"(Check ahead) the tub in front of the residents' houses) is like a kind of moss but the most subtle, sometimes we drain the tub, the tub settles and the faucet in front is rich in crust" (R1. 24). "Then (Check in the bathroom), just for information, I personally closed the bathroom faucet with socks, one week without washing it was yellow like there was pasi sand and iron (while opening the faucet with socks)" (R1. 25). "So my wife took the initiative to filter her socks to reduce the dirt that enters the bathtub" (R1. 28) ".... Even though there was still sand coming in, a cloth was installed in my bathtub faucet so that the sand was reduced, yes, even though sometimes there was still a small amount of sand" (R3. 07).

Figure 1. Fine Sand That Settles in the Bath

3. The impact of borehole water use on dental health

In this theme, several sub-themes are divided, including:

a. Brush your teeth and gargle with iron and sulfur

In this sub-theme, the community gave their opinions about brushing their teeth and gargling with iron and sulfur, the informant said that:

"When you brush your teeth with your mouthwash, it feels like there is iron or sulfur (R1.20).

"If you are going to take a bath, it is safe and very useful, but if it is for gargling or brushing your teeth, I feel that there is a rich taste of iron when it enters the mouth" (R2.

09). only on the teeth when brushing your teeth there is a taste of iron (R3.12) "for bathing I use this drilled well water, but when I gargle this gargle I still feel the taste of iron so it doesn't feel good" (R5. 07). "If for health, I'm not good at teeth, well, if I brush my teeth, when I rinse my mouth, there is a taste of iron (R5.13).

b. teeth become yellow and coral.

In this sub-theme, the community gave an opinion about teeth becoming yellow and rusty, the informant said that: the teeth become corrosive yellow" (R1. 20). "also make teeth marble and yellow" (R3. 12) "If the effect on health is that I have heard that there are people who feel that there are teeth like corals, and also I feel that my teeth used to start to become corals and decrease" (R4. 14) continue my teeth are rich in coral" (R5. 13).

c. Contains high lime substance

In this sub-theme, the community gave opinions about borewells containing high lime, informants said that: "Then for me personally, for his health at the time of the flood still contained a lot of iron and lime (R1. 32).

d. Drilled wells are not consumed for drinking

This sub-theme of the community argues that drilled wells are not consumed for drinking, namely by saying: "For drinking consumption I don't use this water, but I use gallon water" (R3.04) "For drinking I don't use drilled well water, I use gallons or mineral water" (R5.03).

Discussion

In this study, three themes were produced, including drilled well water being the main need during floods, lack of use in households and washing clothes, and the impact of drilling well water use on dental health.

Themes that *first*, regarding drilled well water is the main need during floods. In this theme, the community has a very diverse understanding of drilled well water. Drilled well water is the main source of daily clean water needs, such as cooking, washing clothes, to be consumed as drinking water, washing household appliances and vehicles. In this theme, it is also explained that drilled wells will be the hope of the community when floods occur. This is in accordance with the phenomenon that occurs in the environment of the people living in Kisumu City. Based on research journals Othoo et al., (2020) in Kisumu City water is very important, but most shallow water sources are not protected even though they are used to meet needs such as cooking, drinking, bathing, and so on. For the people of Kisumu City, borewells are the main source of water used for needs such as bathing, cooking, drinking, and so on. The community only relies on well water because there is no affordable city water supply.

The *second theme* is about the lack of borewells in households. From this sub-theme, it is explained that drilled well water has shortcomings that have a bad impact on households, including damage to cooking utensils, namely crusty, yellow spots on clothes, the condition of the bathtub which becomes dirty due to the presence of sand or fine mud that is carried, and is not good for consumption for drinking. This is similar to the previous study with the title "The Relationship between the Depth of Drilled Wells and Iron (Fe) and Manganese (Mn) Levels in Malendeng Village, Paal 2 District, Manado City"

The presence of Iron (Fe) and Manganese (Mn) in the water causes the color of the water to turn yellow-brown after a while of contact with the air. In addition to causing health problems, it also causes unpleasant odors and causes yellow color on the walls of the bathroom and yellow spots on clothes (Misa, A., Duka, R. S., Layuk, S., & Kawatu, Y. T., 2019).

The *third* theme is the impact of using drilled well water on dental health. In this theme, the community not only feels the impact in the household, but also in dental

health is also felt by the people of Sirau Village. Drilled well water that has high levels of lime can cause damage to teeth, namely the appearance of corals and dental plaque. Not only that, there is a lime substance, and the taste of iron when gargling becomes less good when consumed for drinking.

Based on the research journal Nyolo Nyolo, C., (2022) showed that most of the respondents (treatment group) with limestone water were in the medium category, namely 24 people (55.8%). This is because the well water used contains lime. High calcium levels can increase calcification and tartar plaque formation. The inorganic components of plaque are made up of calcium, phosphate, and other minerals.

CONCLUSION

This phenomenological study of five Sirau Village residents who have used drilled well water for over 10 years revealed that while drilled well water serves as an indispensable primary resource for daily needs during and after flood disasters—particularly in areas without municipal water supply—its usage presents significant adverse impacts on both household economics and health, including crusty deposits on cooking utensils (approximately 3mm thick monthly), yellow staining on clothes, rust formation on metal items, fine sand accumulation in plumbing fixtures, dental corrosion, tartar formation, plaque buildup, and yellowing of teeth due to excessive iron (Fe), sulfur, calcium, and lime concentrations that exceed quality standards. Despite awareness of these health risks—evidenced by residents' reluctance to consume the water directly for drinking and their consistent reports of unpleasant metallic taste when gargling—the community continues relying on drilled well water due to limited alternatives, underscoring the urgent need for community-based water treatment interventions such as aeration-filtration systems, regular water quality monitoring, and future research on low-cost treatment technologies to reduce iron and lime concentrations to safe levels for consumption.

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