



Untold Story: Water Source Problem of Barangay Cagangohan, Panabo City, Philippines

**Divine S. Onabia¹, Rosemarie B. Arcena², Kris Jean L. Laguna³,
Jovany Gleen L. Allawan^{4*}**

Department of Teachers Education, UM Panabo College, Philippines | onabiad182@gmail.com¹

Department of Teachers Education, UM Panabo College, Philippines | onabiad182@gmail.com²

Department of Teachers Education, UM Panabo College, Philippines | onabiad182@gmail.com³

Department of Teachers Education, UM Panabo College, Philippines | jovany.allawan@umindanao.edu.ph⁴

Correspondence Author*

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Abstract

This research tries to determine the life experiences of parents in Cagangohan, Panabo City, related to water pollution. The participants were selected through purposive sampling by choosing six respondents. The phenomenological research approach was employed in this study to get their views from their experiences, some of their alternative solutions, and the insights they have gained in facing the problem. Further conclusions can be drawn from the findings about how parents are able to find alternative ways to maintain the health of their families despite the lack of clean water in the community. This result may be used by the government, educators, parents, students, and future researchers as a foundation for offering suggestions and solutions for mitigating the problem of a lack of water sources in the community.

Keywords: water pollution, lived experiences, parents, local community

Introduction

More than two-thirds of the human body is composed of water, including 90% of the lungs, 80% of the blood, and 95% of the human brain. Every living thing on the planet, notably the human species, depends on water. Many people globally do not have access to clean water. Given all the negative effects linked to frequently using filthy water, this is rather concerning. Many people would rather use and eat unclean water than none at all. Consider the concerning

number of people who consume contaminated water globally (Charles, Nowicki, Bartram, 2020; Familusi, Adekunle, Badejo, Adeosun, Mujedu, Olusami, & Ogundare, 2021).

Everyone on Earth should make protecting the earth's water a priority since, as is well known, around two-thirds of the earth is composed of water. Water bodies become contaminated when dangerous microbes and chemicals are present, which lowers the water's quality and may even render it hazardous. The economy, the ecology, and our health can all be negatively impacted by water contamination (Al-Maliki, Farhan, Jasim, Al-Mamoori, & Al-Ansari, 2021; Fu & Liu, 2017).

Furthermore, when it comes to sustaining life, water is one of the most crucial components on Earth. Sadly, it is also incredibly vulnerable to pollution. This is mostly due to the fact that water is a universal solvent that can dissolve a wide variety of compounds. This is a beautiful property that we utilize for routine activities like cooking, cleaning, and taking medications, but it is also the property that makes water so easily contaminated (Familusi et al., 2021).

According to the 2019 United Nations World Water Development Report, four billion people endure a severe water shortage for at least one month of the year, while over two billion people experience significant water stress. The climate catastrophe is also making things worse. One of the key concerns of international organizations is the declining availability of water. The Sustainable Development Goal (SDG) 6 of the UN's Agenda 2030 aims to ensure that everyone has access to water, a sustainable system for managing it, and appropriate sanitation (Ahmed, Mumtaz, Anwar, Mumtaz, & Qamar, 2020).

Pathogens (primarily from human and animal waste), organic matter (including plant nutrients from agricultural run-off, such as nitrogen or phosphorus), chemical pollution, and salinity (from irrigation, domestic wastewater, and run-off from mines into rivers) are some of the pollutants that can affect freshwater ecosystems (Al-Maliki et al., 2017). Although the quantity and effects of these pollutants' existence in our freshwater are mostly unknown, they progressively endanger the world's rivers together with other new pollutants like pharmaceuticals. According to Roeger & Tavares (2018), public health, quality of life, environmental preservation, economic activity, and sustainable development all depend on a reliable water supply. In this situation, it is crucial to ensure that all procedures and methods used to ensure the safety and purity of the water are continually improved.

The worldwide development agenda included drinking water quality monitoring thanks to the sustainable development goals (SDGs). From the standpoint of infectious diseases, *Escherichia coli* is currently the main metric by which we assess the safety of drinking water. In this article, we offer and put into practice a framework for considering the goals and methods of drinking water safety monitoring (Charles et al., 2020; Zhang, Lü, Shao, & He, 2014).

In a past study in China on 2004, the international community suggested the use of water safety plans (WSPs), a thorough risk assessment and management strategy. WSPs are implemented in five steps, and then are evaluated. WSPs have been used in almost 90 countries so far, but their general adoption is constrained by the absence of outcomes and impacts that have been formally documented. A systematic review of outcomes on lessons learned from

general, rural, and country-specific Water Safety Plan implementations (Li, Smith, Cohen, Wang, Li, Zhang, & Zhang, 2020).

Moreover, according to Vaseashta (2013) to assess national and international capacities to be able to respond, sense/detect, isolate, and mitigate safety and security risk vectors in a timely manner, it is crucial to identify and prioritize contaminants resulting from sporadic release or intentional discharge in unprotected water supplies. Innovative point and stand-off sensors/detectors for continuous and in-situ monitoring of inorganic, organic, and microbiological contaminants are detailed using cutting-edge and nanoscale materials (Ruzol, Banzon-Cabanilla, Ancog, & Peralta, 2017).

For the sake of people's health, the security of the drinking water supply is crucial. Inactivating microorganisms from drinking water makes disinfection one of the most important water treatment procedures. Disinfection byproducts, which are linked to cancer and reproductive/developmental issues, could, nevertheless, have a negative impact on human health. The research leads to the development of numerous optimization and predictive models. A monitoring, modeling, and optimization tool-integrated early warning system is still lacking (Li et al., 2020; Tsitsifli & Kanakoudis, 2018).

Cultural theory aids in a more thorough explanation of management results whereas social network analysis provides a rigid assessment of network structure. The combination of these techniques offers important and unique insights into the difficulty of managing water pollution. Two types of relationships—resource sharing and cooperative activities—were assessed using the case study of the Calumpang Watershed in the Philippines as an example (Ruzol et al., 2017). One of the main issues facing the Philippines is water pollution. Biologically dead rivers no longer contain any oxygen and can only support the hardiest types of species, according to the DENR, which estimates that up to 50 of the 421 rivers in the nation are already deemed to be biologically dead (Andrews, 2018).

In addition, social network analysis was used to evaluate the factors that influence collaboration and the building of bridges, and cultural theory was applied to uncover the underlying beliefs of key actors regarding the nature of the river and its administration. The evidence demonstrated that resource sharing had a major impact on collaboration regardless of institutional affiliation, while bridges were built by serving as the network's hubs for information and resources (Ahmed et al., 2020; Liu, Engel, Flanagan, Gitau, McMillan, Chaubey, & Singh, 2018).

One of the primary economic tools for managing and controlling water pollution is water pollution compensation, and the quantification of compensation standards is a crucial component of putting ecological water pollution compensation into practice. The emergent analysis method of ecological economics was introduced to the quantitative research of water pollution ecological compensation because ecological compensation relates to ecological environment, society, and economy at the same time (Roeger & Tavares, 2018).

The research questions of this study includes the following: (1) What are the experiences encountered by the parents in the problem if water pollution? It is to know the everyday they encounter in water pollution; (2) How these parents cope with the problem of

water pollution? It is to determine on how they overcome some of their challenges they face as a parents and residence in Cagangohan; (3) What insights they learned in their experiences? It is to investigate if they are willing to compromise with the local government despite of their difficulties.

Literature Review

According to Liu et al., (2018), best management practices (BMPs) are well-liked strategies for enhancing water quality and hydrology. Overestimating the long-term effectiveness of watershed planning techniques may be caused by uncertainties in BMP effectiveness over time. A high level and futuristic modeling framework were created to describe varied long-term BMP effectiveness in hydrologic/water quality models. Efficiency throughout the establishment period, efficiency at startup, efficiency for each storm occurrence, efficiency between maintenance, and efficiency over the life cycle are the components of the framework. Together, they show long-term effectiveness for a particular approach and a particular environmental issue such as runoff or pollutant (Tsitsifli & Kanakoudis, 2018).

Research Method

Participants

The participants in this study were those parents who experienced water pollution around their surroundings for at least one year. Through purposive sampling, we selected six participants who are residents of Barangay Cagangohan, Panabo City, province of Davao del Norte, Philippines. Participants should have been residents of Cagangohan for at least five to ten years so that they can best describe and explain their experiences. Thus, to identify the participants, the following are their demographic profiles: parent 1 is male, 30 years old, from the Barangay Cagangohan; parent 2 is female, 62 years old, from the Barangay Cagangohan; parent 3 is female, 29 years old, from the Barangay Cagangohan; a 32-year-old who has two children; a 35-year-old parent; and a 49-year-old mother of five children, all of whom experienced water pollution for almost 10 years. To ensure that the data needed to expedite the study accurately addresses the research question. According to Tudy & Millan (2023), qualitative research is concerned with participants' own experiences of a life event, and the aim is to interpret what participants have said in order to explain why they have said it. Thus, methods should be chosen that enable participants to express themselves openly and without constraint (Allones & Allawan, 2023).

Materials/ Instruments

The researchers utilized an interview guide questionnaire and audio recording as instruments for this study to collect more information from the respondents who lived in Barangay Cagangohan, Panabo City. Following the interview guide questionnaire that is being printed, researchers also used to be able to elaborate more on the questions that include the

respondent's experiences in such a way that the respondents would further understand each question and would answer it with their own perspective, feelings, and concerns about the current issues that they have encountered. Twelve questions are being supported. They did scan the instrument and even have it examined by their professor to make sure that it was valid.

Design and Procedure

The study used a narrative approach under qualitative research. According to Dalogdog, Cunado, Dacles, & Allawan (2023), narrative inquiry is defined as an approach to research that seeks to explore the perceptions and personal stories of the participants. For the data collection and investigation, the researchers conducted an in-depth interview with an open-ended questionnaire to gather factual information and answers for the study. In addition, the use of purposive sampling in the research design helped the researcher collect information from the respondent's individual experiences (Allones & Allawan, 2023; Tudy & Millan, 2023).

Results and Discussion

The Experiences Encountered by the Parents in the Problem of Water Pollution

Water safety and security

The first theme that emerged in the experiences of parents about the problem of water pollution. All participants encountered the same issue of water quality in their everyday living that may challenge them. Moreover, it was elaborated by the participant coded IDI_P1 his experiences:

"Sometimes the water here in Panabo is dirty and you have to swallow it." - IDI_P1

"Most of the time we have a problem, which is that sometimes it is clean and sometimes it is dirty." -IDI_P4

"Sometimes it is submerged, sometimes it has sand and smells like rust." -IDI_P5

It is clear from the responses of the participants; they are all experience the of water pollution on how they use it as a drink or not. An essential component of community health and public health is a reliable supply of potable water. Water suppliers, operators, and management in particular have been complacent, which has resulted in numerous and largely preventable waterborne outbreaks (Chowdhary, Bharagava, Mishra, & Khan, 2020).

Human Problems

The second theme for the first objective, which is parents experience the problem of water due to man-made doing. It is further stated by the participant codes IDI_P2 the challenges he faced as:

"I cannot do anything but we have to cover socks and taps because there is always worm." -IDI_P2

"We do not want to do that. I mean, we cannot wash the dishes because the water is dirty." -IDI_P4

“I am always sad because it can affect the health of my family.” -IDI_P6

Based on the responses of the participants they are experiencing the water pollution that also human created. Water pollution is mainly concentrated in industrialization, agricultural activities, natural factors, and insufficient water supply and sewage treatment facilities. First, industry is the main cause of water pollution, these industries include distillery industry, tannery industry, pulp and paper industry, textile industry, food industry, iron and steel industry, nuclear industry and so on. Various toxic chemicals, organic and inorganic substances, toxic solvents and volatile organic chemicals may be released in industrial production. If these wastes are released into aquatic ecosystems without adequate treatment, they will cause water pollution (Chowdhary et al., 2020; Paul & Bandiez, 2011).

Improper Waste Segregation

The third theme that answer the first research question, most of the parent's response the garbage us the main reason of a polluted water. In Barangay Cagangohan, they are near in coastal area which is one of their tourist spot and source of their income. But the problem more people come, the increase rate of garbage dump in many sides of road or in coastal area. Waste that are not separated and the garbage can are useless as they attempt not to use the disposal can. The improper waste segregation is something that should stop but the community are not ready to work with the government. With this participant codes IDI_P1 quoted:

“The problem is on our side, because people are careless in their garbage, no matter where they throw it in the sea, there is usually a canal connected to the sea.” -IDI_P1

“Maybe the water is almost from the garbage so it smells dirty.” -IDI_P3

“The water pollution maybe in the garbage we throw”. -IDI_P6

In all possible cause if water pollution, the parents saw the wrong segregation of garbage as a big challenge to everyone. The degradation and pollution of the environment, caused in large part by human activities such as industrialization and agricultural practices, has a negative impact on water bodies such as rivers and the ocean, which are essential for life (Paul & Bandiez, 2011).

Water Quality

The last theme for the first research quesiton, majority of the parents experience a difficulty of finding clean water that they can drink safe and take a bath. If the problem continues to exist, they see a bad impact in the health of their family, as the respondents answer and facing some of their experiences. They are afraid for their family in terms of water that they drink, because they have children and safe water is the important for them. The lack of improving water quality is one of the major problems in their community. However, they are aware that poor water quality can cause health issues in their body especially to those pregnant women, babies, elders and children. Therefore, majority of them choose to not drink the water from the faucet and that it is important to really addressed this kind of problem. The participant coded IDI_P3 his experience as:

“I did not get sick, but other child, but also tough.” -IDI_P3

“Do not use dirty water, use clean water.” -IDI_P4

“Let us all work together to clean up the environment especially the canal.” -IDI_P6

Based on the parents they are afraid for the health of their family due to the problem of water. The most valuable economic resource for people is surface waterways, which provide water for anthropogenic activities like agriculture and industry. Aquatic ecosystem protection is critically dependent on the quality of surface water. Unplanned urbanization, intensive agricultural practices, and deforestation are all positively correlated with water quality metrics linked to carbon, nitrogen, and phosphorus (Atienza, 2011).

Parents Cope with the Problem of Water Pollution

Majority of the respondents use some method solutions in coping the problem of water pollution. Based on the responses of the participants, they are coping the problem of water policy and regulation, poor water mitigation and solutions, water quality, and awareness and education.

Water Policy and Regulation

The first theme in second research question, some parents share the same alternative solutions to cope the problem if water pollution. They see a proper regulation to all sector in every place in Cagangohan to at least mitigate the issue. Further, participant-coded;

“It is just part of us, our environment is not clean because of air pollution, it is unavoidable because we have a lot of vehicles, right.” -IDI_P1

“We are about to move, so I do not seem to have a plan for that. If there is such a problem, add chlorine and clean the water source and properly.” -IDI_P3

“Clean the environment and avoid throwing garbage.” -IDI_P5

Most of the parents apply simple method to have a safe water to drink, a usual way to kill the bacteria in the water by sterilizing. Additionally, it demonstrates how varied contentious rhetoric, the pursuit of multiple interests, social interactions, and broad transformative forces influence the execution of municipal water policies. Because of the great level of diversity, institutions are becoming more flexible (Mordeno, Sabac, Rouullo, Bendong, Buan, & Yuenyong, 2019).

Poor Water Mitigation and Solutions

The second theme for second objective is that parents identify as the lack of education in water mitigation and solutions. Maybe in the system of whole community or the irresponsible people. Further, participant-code IDI_P1 his experience as:

“For me, water is important we do not have anything to use.” -IDI_P1

“I will just sterilize the water that I am drinking together with my family, but not when we take a bath.” -IDI_P2

Untold Story: Water Source Problem of Barangay Cagangohan, Panabo City, Philippines

“Waiting for the water to be right instead of hurrying, what can you do, you cannot do anything but wait.” -IDI_P4

Other may see the problem of water pollution, but they are not doing their part to control the problem by doing some steps to help the environment. Base on their experiences, they encounter poor water mitigation and poor solutions. According to some of them, there some residents that did not really care on their surroundings. Consequently, this results to lack of adequate and safe water which is concerning for the health of the community (Nguyen & Tan, 2020).

Awareness and Education

The last theme for the second research question that shows the response of the parents who agreed that the problem of water pollution is needed to be address through educating everyone to be aware of what is happening. Through our interview, we notice that all of the respondents are aware on what is going on in their surroundings. Therefore, they mentioned some strategies that could avoid possible risk. However, not all residents care the environment. The parent-participant coded IDI_P1 their experience as:

“Of course, we all need to participate, segregate garbage. That is where the garbage goes.” -IDI_P1

“Segregate it so that the dirt does not mix. If the environment is dirty including the water.” -IDI_P4

“Everyone should be united and the governments should take action to make the people here more active.” -IDI_P6

In the past study conducted in Macajalar Bay, city of Cagayan de Oro Philippines and in the Santa Cruz watershed, Laguna, Philippines which established a structural equation model for the relationship between recycled water knowledge and acceptability in order to test whether environmental education can serve as a guide for people in terms of the reuse of recycled water and to further confirm its mechanism of action (Felisilda, Asequia, Encarguez, & Galarpe, 2018; Nguyen & Tan, 2020).

Informants Response on the Insights of Water Pollution they have Experience

In the problem of water pollution, the respondent's able to learn what is happening in the community due to human action. Based on the responses of the participants, they learn insights of sustainable water management, proper water usage, clean water maintenance, and water policy and regulation.

Sustainable Water Management.

The first theme for the third objective shows the answer of the parents, that it is needed to take an action to solve the problem of water pollution. They give an example of alternative solutions that are best for those parents who are experiencing a problem of water. Moreover, it was elaborated by the participant coded IDI_P1 their insights:

“We need to unite and actively participate. Clean the area just like now you’re not comfortable, because you think that the garbage was just coming back.” -IDI_P1

“Yes, we really need to clean our surroundings so that we have a clean water in well, so basic.”-IDI_P3

“Many but more on experience dirty source of water and the surrounding should be clean.” -(IDI_P4)

Zhang et al. (2014) have suggested a system to monitor water quality online and employed machine algorithms to help users make informed decisions. Continuous data from various websites is gathered in a data repository for tracking and analysis. Machine learning techniques including pixel based adaptive segmented and bag of words approach will used on this data to aid a user to make educated choices. Was utilized for continuously monitoring of turbidity, optical dissolved oxygen, temperature, conductivity, and depth for the author’s study on Dublin Bay. To detect anomalous events from a continuous data stream, the authors have modified and applied pixel-based adaptive segmented from the image processing domain. After anomalous occurrences are detected, their features are retrieved and clustered in order to execute decision making (Nguyen & Tan, 2020).

Proper Water Usage

The second theme for the third objective that identify by the use of answer of the respondents. In their respond they really believe that the right way to mitigate the problem of the water pollution is to have a proper usage in our own water that we get and how to make it sure that is clean. Moreover, the participant coded IDI_P2 their insights:

“Filter the water properly to avoid sickness.” -IDI_P2

“It was really a big help for us to know how to clean our environment and the water.” -IDI_P3

“I have a lot of learning especially when it comes how to clean the water.” -IDI_P6

In using the water now, the there is a proper way of cleaning it safe for everyone. It is something that ever should know according to all the respondents, that early in this generation we should needed to address the issue that can lean to a major effect in the society or in whole country. The proper usage of water is the responsibility of everyone to practice in every situation (Felisilda et al., 2018).

Clean Water Maintenance

The third theme for the third objective that indicated base on the answer of the respondents. They all agreed that the community should have proper maintenance in water. It is further stated by the participant coded IDI_P2 the insights they mentioned:

“For us to avoid being sick. We should really address it to the government to have a clean environment.” -IDI_P2

“To avoid sickness because every wrong doing will hit us back.” -IDI_P3

Untold Story: Water Source Problem of Barangay Cagangohan, Panabo City, Philippines

“It is a big help specially to children and elderly because they’re prone to catch diseases and at least to avoid it.” -IDI_P6

In every community or municipality there is always arising issue about the environment that are truly exist and a problem for everyone. In a rural area they needed to buy water or pay it for their household chores cleaning. Very different from urban area, in rural they have no choice to wait for the action on how the water back or safe because they are only a buyer, they do not have land for their own source of water (Jimeno, Briz, Artiaga, Angelia, & Limsangan, 2021).

Water Policy and Regulation.

The last theme for the third objective that according to the parents to address the problem we needed to have policy. And the government should impose it clearly with the people in the community. Moreover, participant coded IDI_P2 his insights:

“We should segregate our garbage properly, like separate the recyclable and non-recyclable.” -IDI_P2

“Let just keep our surroundings clean and throw our garbage properly.” -IDI_P3

“Cleaning our environment is really the key.” -IDI_P4

Environmental awareness campaign target the social groups with its various cultural, economic and social sub groups. Individual’s preparation plays an important role in environmental improvement. The individuals, family and community play crucial roles in promoting concepts of environmental awareness, achieving ecological health levels, and setting the right foundations for future growth and improvement. Parents at home are form the foundation for instilling environmental concepts among young people. Thus, it is important to raise them in early awareness of environmental threats and foster them with a mental readiness to prevent their occurrence (Wang, Liu, & Dang, 2018).

Conclusions

Based on the results of the study, the parents who lived in barangay Cagangohan, Panabo City, Philippines experienced a problem of lack of water source in their area. They are aware that it is also due to their action and irresponsible behavior that led to the damage of the environment and the safety of water they drink. In that experience they are able to become adaptive from the issue they are facing, like usually boiling the water before it will be use to drink, cook, or other related water function. And other parents buy sterilized water even though it is expensive for their everyday use, but they have no choice to buy a trusted water. They know what the cause of water pollution but they believe that it will be okay if everyone knows their responsibility before taking an action.

Regardless of the absence of local government platform in their area, they are willing to cooperate and do their part to follow and practice some alternative solutions and be educated

by the policy and regulations that talks about water pollution. It is not too late to start for the beginning to the next generation if we never let our tomorrow a disaster one.

Recommendation

The findings of the study show that the parents in Cagangohan experience a problem of water pollution. And it needed a platform that will support them towards an effective solution, to unlock the lock of education in facing the problem if water in the community. However, platform cannot stand alone without the people itself. The researchers recommend the following:

First, the local community leader should have an initiative to talk the people about the related issue that they are facing. What are some of their problems that needed an action and support from the government.

Second, all leader should think and plan on how they will be going to impose a policy or regulations that will help lessen the problem of garbage. That can lead to a water pollution and destroy the human resources in the biodiversity as well as the source of water.

Third, a free orientation or educating everyone about the existing problem in the community. To help the grasp what is something to do to avoid.

Finally, work ethics of each in everyone in the community, whether you are a leader or not know your responsibility as a human.

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