



COMPILATION OF RESEARCHES
#WeCAN International Research Colloquium

*Into the Future: Scaling Impact Through Social Entrepreneurship and
Social Innovation—A Commitment to SDGs*

Lasallian Social Enterprise for Economic Development Center
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De La Salle University

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About De La Salle University

De La Salle University positions itself as a leader in molding human resources who serve the church and the nation. DLSU is a catholic co-educational institution founded in 1911 by the Brothers of Christian Schools. The University is a hub for higher education training renowned for its academic excellence, prolific and relevant research, and involved community service. Nestled in the heart of Manila, DLSU is home to local and international students seeking quality education for a brighter future. It is situated in a vibrant city where culture and diversity are well manifested. It is worth noting that DLSU is the first university in the Philippines to localize the United Nations Sustainable Development Goals (UNSDG) through its social engagement programs.

About Lasallian Social Enterprise for Economic Development Center

The Lasallian Social Enterprise for Economic Development (LSEED) Center is a leading center for social entrepreneurship of the country and the flagship unit of De La Salle University (DLSU) in areas of social entrepreneurship (SE) and social innovation. It localizes the United Nations' Sustainable Development Goals by working with students and marginalized communities in creating social enterprises.

The LSEED Center implements various programs in areas of student formation and SE development, curricular and co-curricular integration, research, internship and volunteerism, advocacy, internationalization, and incubation and acceleration.

In 2019, DLSU, through the LSEED Center, was named First Runner-up for "Academic Leadership in Social Innovation" in Asia Pacific by ASSIST, ADB, and Asian NGO. In 2023 and 2024, ACEEU named the LSEED Center First Runner-up for "SDG Initiative of the Year in Asia Pacific." It was also declared "People's Choice" by ACEEU in 2023 and received a "Merit Award - Community Outreach in Asia" during the eLearning Forum Asia 2024.



About #WeCAN International Research Colloquium

The Sustainable Development Goals (SDG)—adopted by the United Nations as a development platform—emphasizes inclusive and sustainable development. It encourages stakeholders and social development institutions to initiate and develop programs that will address poverty and the lack of opportunities for the poor. The call is to recognize and maximize existing capacities, innovate, and develop strategies in the context of partnerships and collaboration. In the long run, this will help generate concrete plans of action on priority areas of development. The need to establish and promote relevant and proven approaches and strategies is made more urgent with recent statistics and narratives on poverty, especially those induced by climate change, often impacting the sector that is least able to cope with the consequences.

This year's #WeCAN International Research Colloquium—with the theme *Into the Future: Scaling Impact Through Social Entrepreneurship and Social Innovation—A Commitment to SDGs*—brought together researchers, practitioners, and individuals for a series of research paper presentations on the future of SE and social innovation as drivers of the SDGs, with a particular focus on inclusive education, inclusive growth, and universal topics healthcare.

The colloquium took place online—via Zoom—on November 28, 2025 with participants joining from all over the Philippines. Four (4) impact-driven research papers were featured. One the one hand, one (1) research paper under the “Quality Education” subtheme featured the lived experiences of secondary school teachers in an islam community in Quezon Province, Philippines and another one (1) under the “Inclusive Growth” subtheme explored the health impacts, socioeconomic burdens, and social enterprise solutions to water insecurity in the Philippines. On the other hand, two (2) research papers under the “Universal Healthcare” subtheme shed light on public health issues concerning wastewater epidemiology and soil-transmitted helminthiasis in the Philippines.

In 2023 and 2024, the same online colloquium was held by the LSEED Center. It showcased various impact-driven research on quality education, inclusive growth, universal healthcare, and environmental sustainability. In 2019, DLSU, through COSCA-LSEED, successfully implemented the #WeCAN International Boot Camp, which brought together various universities from ASEAN member countries as well as those from Japan, China, and South Korea to a 10-day Boot Camp on social entrepreneurship. One component of the boot camp was a research colloquium, which showcased research on SDGs of students, faculty, and development professionals and practitioners.



Compilation of Researches based on SDG Themes

Quality Education

Tibay at talim: Exploring the katatagang-loob of teachers working on Talim Island
by Elyza Mae Guevarra, Mikaela Aurhea Arbizo, Rochelle Carls Peñafiel, Rocel Beatriz Reyes, and Alicia Tablizo

Inclusive Growth

Water insecurity in the Philippines: Exploring socioeconomic burdens and social enterprise solutions
by Patricia Anne Battad, Samantha Claire Caseñas, Aiden Gabriel Pamplona, and Mark Anthony Rogelio

Universal Healthcare

Wastewater-based epidemiology in the Philippines: Current status, challenges, and future directions for public health surveillance
by Melissa Ellaine De Luna, Miriel Lacson, Kyle Gabriel Santos, Arabella Jannie Umali, and Jessamine Gail Inson

Knowledge, attitudes, and practices on the control and prevention of soil-transmitted helminthiases among residents of San Antonio, Quezon, Philippines
by Johanna Camille Liwanagan and Mary Jane Flores



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***Tibay at talim: Exploring the katatagang-loob of teachers
working on Talim Island***

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ABSTRACT

This study investigates the lived experiences of teachers assigned to Talim Island to understand how katatagang-loob are contextualized in fulfilling their teaching duties. This is a qualitative approach that utilizes Interpretative Phenomenological Analysis (IPA) to explore these experiences in-depth. Data is collected through professionally validated semi-structured interviews formulated by the researchers to ensure a rich understanding of each teacher's perspective. A purposive sampling technique is employed to select 12 participants who were qualified from the required criteria—(1) must be living outside Talim Island, (2) licensed professional teachers, (3) must have at least three years of teaching experience, (4) secondary education teachers, and (5) must have at least one month to thirty years of teaching experience on the island. The IPA by Smith and Nizza (2021) was applied to analyze the gathered data. Upon the completion of data analysis, it was identified that there are five central themes in the study which are (1) collaboration with island residents, (2) teachers support network from their surroundings, (3) lifestyle management of teachers to sustain their work-life balance, (4) perspective to katatagang-loob solely as mainland (tagabayan) teachers, and (5) contributing factors that emerge to build up their katatagang-loob as a mainland (tagabayan) teachers. The findings entail that the katatagang-loob of mainland (tagabayan) teachers came from their experiences as they teach on the island. The compassion and empathy they have for the community, especially for the students on the island, contributes to how they build up their katatagang-loob.

Keywords: katatagang-loob; teachers; Talim Island; resiliency; lived experience; mainland (tagabayan) teachers; challenges; compassion; education; and call of duty

INTRODUCTION

Being a teacher is an amazing job, especially for any educator sent to a remote area, particularly on an island. A teacher's job or career in teaching is intended to bring about significant learning with the goal of promoting education. Also, teachers from the southern Philippines travel across the

water to bring educational resources to island communities (Suson, 2020). Despite experiencing sudden changes in their work structure when the global emergency happened (Sokal, Trudel, & Babb, 2020, as cited by Lizana, Vega-Fernandez, Gomez-Bruton, Leyton, & Lera, 2021), lots of teachers still take the Licensure Exam for



Teachers in the Philippines with a rate of 40.76% elementary teachers and 46.94% secondary teachers were successfully passed when it was held last March 19, 2023 (Professional Regulation Commission, 2023).

Additionally, as cited by Felisilda (2023) in the work of Benevene, De Stasio, and Fiorilli (2020), “well-being is more concerned with teachers’ ability to achieve a positive but dynamic equilibrium between their resources and their challenges/demands (environmental, social, individual, physical, mental, psychological).” This asserts that teachers do their best to teach their students as long as they keep their means and obstacles balanced.

In the documentary of GMA Public Affairs (2018) mentioned that education in remote areas has limited materials and equipment availability in learning. To support that statement, Bai (2023) stated that due to a lack of

infrastructure and resources, the Philippines’ education system faces major challenges, especially in rural areas. Learning is further complicated by the fact that many schools lack proper classrooms, textbooks, and instructional resources. This problem is not exclusive to rural regions; it also exists in cities. Also the lack of resources paired with bad infrastructure has a major impact on learning and teaching outcomes. In order to retain student engagement and provide successful lessons without sufficient resources, teachers in remote areas frequently confront great challenges that force them to rely on conventional, lecture-based teaching approaches.

Moreover, a study findings indicated that the four primary issues that worry the households on the island are: weather-related disruptions of the island group's geographic accessibility, large waves, unsafe



vehicle conditions, and neglected schedules (Hilvano, Bantayan, Pulhin, Nelson, & Arboleda, 2022).

This study aimed to understand the katatagang-loob of the teachers. Its purpose is to gain insightful comprehension regarding the context of Filipinos katatagang-loob of educators in one of the remote islands in the Philippines. Conducting this study can allow the researchers to identify the significant themes and patterns and bring to light a deeper understanding of the experiences of the teachers on Talim Island.

The study assists in providing further interpretation of the phenomenon being observed in a real-life condition and, therefore, can potentially administer collective understanding. In addition, the presented study can investigate how teachers' katatagang-loob contributes to their students' development, enhances the learning approach, and

fosters educational success. Correspondingly, it may aid the Philippines' educational system regarding educational psychology by accommodating advanced knowledge about the teachers' katatagang-loob in the practice of their careers.

“Loob ng Tao” as Theoretical Framework

The “loob ng tao” theory developed by Albert Alejo (2018) suggests that loob dwells in the dimensions of action. Suppose an individual acknowledges the call of decision-making and responsibility through abot-kaya (extent of strength). In that case, one's willingness or broad-mindedness can be determined through his or her abot-malay (extent of consciousness) and abot-dama (extent of feeling), in which one's loob can also be perceived. On that account, loob as abot-kaya is composed of the extent of abot-malay



and abot-dama. However, an individual's loob in abot-kaya has its limitations, depending on his or her circumstances. It sometimes reaches its complete extent, making abot-kaya a measure, an attempt, and being flexible (Alejo & Riddle, 2018).

Utilizing this theory can qualify the analysis of the potential assistance of individual and contextual aspects of the katatagang-loob of teachers working on an island as well as contribute to resolving the gap in the presented study. In this concept, there is an understanding of building up one's loob and the will of an individual to make progress despite everything that can also mean something. Therefore, this framework can also provide an understanding of the teachers' tendency to achieve something based on their interiority or inner character.

Katatagang-loob

In a semantic analysis of katatagang-loob according to Tiangco (2005), "the word can be broken down into two: katatagan and loob. The word, katatagan comes from the root word tatag which means established stability. As a verb, itatag means to build or the act of establishing. When used as an adjective, matatag or katatagan pertains to durability and endurance. Hence, the idea of strength (tibay) within the context of matatag or katatagan is characterized not as forceful strength or power. Still, rather as a sense of stability, durability, and endurance" (p. 59). It pertains that the practice of the Filipino resilience philosophy, known as katatagang-loob, is characterized by harmony with an unchanging nature. Moreover, the primary goal of survival is not to make a forceful display of dominance over the natural world.



Other than katatagang-loob, there is tibay ng loob which also means inner strength and being matatag. In line with Pe-Pua (2018), there is “loob plus tibay” (durability) meaning tibay ng loob (strength or durability of the loob), a noun that speaks of a steady, unflinching inner strength. Someone who is matibay ang loob, an adjective, is unflinching, determined, and brave. When there is a crisis that someone is having trouble with, one is given this advice “tibayan mo ang loob mo” (“strengthen your loob,” which is a call on that inner strength). Katatagang-loob does not only mean having just inner strength in what you do and what crisis you are facing, but it also has a connection with dignity in oneself. Based on the work of Demesa (1987) as cited by Pe-Pua (2018), lakas ng loob is an essential component of pagbabagong-dangal, which gives one the ability to overcome hardships and even death in

order to preserve the dangal (dignity, honor, or goodness) within one’s being.

These theoretical definitions of katatagang-loob in Filipino resilience philosophy focus on understanding the concept from a theoretical perspective. However, these frameworks generally establish the term in the context of theory, rather than its practical application. In accordance with the study, katatagang-loob will be further explored and defined through the lived experiences of individuals. By emphasizing their ability to navigate, adapt, and persevere amidst the challenges they face in their distinctive environment. This operational approach aims to interpret the concept of katatagang-loob by focusing on personal narratives to uncover how it manifests in real-life conditions and to identify the significant themes and patterns that shape it.



Katatagang-loob of Teachers

A study discussed that katatagang-loob is the interpreted word of resiliency in the Philippine context and is also expressed as an innate quality of being a Filipino (Tiangco, 2006; Basallajes, 2013, as cited by Estacio, 2020). Additionally, the work of Tiangco (2006) was also cited by Borilla (2022) mentioning that the corresponding Filipino term for resilience is katatagang-loob, which represents the attributes and ability of Filipinos to cope with any difficulties they encounter. In the areas of education, the katatagang-loob, or resiliency of teachers have been essentially contributing in accommodating not only their well-being and practices but also the overall effectiveness of the educational approach. It was defined in a study by Almagro and Flores (2023) that the resilience of teachers incorporates emotional and psychological aspects

including fostering positivity, being adaptable, as well as effectively managing emotional reactions and responses to stressors. In the same study, a result indicated that teachers who are inclined to view their careers as significant, purposeful, and valuable have the potential to exhibit resilience. Demonstrate profound dedication to their field involving the learners and academic function, and manifest increased motivation. Further elaborating on this concept, Fonte, Yazon, Tan, Buenvenida, and Bandyoy (2021) stated that despite the demands of being a teacher, those with higher levels of resilience are more committed to putting effort into enforcing modifications that can improve the academic environment and influence the teachers' job efficiency. In addition, the work of Aquino (2013) was also cited by Fonte et al. (2021), mentioning that as teachers inevitably encounter



difficulties, the drive is for them to develop resilience.

Teachers require resilience in order to successfully manage the quantity of demands and difficulties that come with their line of work. As highlighted by Lacaba, Lacaba, and Calinawan (2020) resilience enables teachers to not only manage the demands of their work but also to achieve professional development, fulfillment, and overall well-being. Teachers need to be constantly developing in their teaching approaches as well as in their dedication to student success in the face of different student demands and ever-changing educational environments. Also, resilient teachers demonstrate commitment, dedication, and adaptability in their profession, believing in learning from challenges and maintaining a positive outlook. Besides, their resilience is linked to their ability to handle changes, engage in professional development, and

enhance teaching abilities (Judilla & Rellon, 2022).

Furthermore, teachers in the educational sector require continuous professional development to stay updated with emerging trends, improve teaching methods, and expand expertise. Reinforced structures and a positive atmosphere motivate them to face their career confidently. To support this, as discussed by Baraquia (2022), the value of professional development activities such as ongoing education, skill-building courses, and chances for both career and personal development. Support systems such as social support groups, emotional support networks, motivators, and a dedication to personal development are emphasized as critical elements supporting the development of teachers' resilience and well-being.



Teachers Teaching on an Island

The importance of technology in empowering educators and improving their skills has grown in the constantly shifting educational environment nowadays. With an emphasis on technology integration and fully online instruction, teachers' preparedness, ability, and online skills are essential for combining traditional and online teaching approaches in blended learning environments (Sente & Gorriceta, 2021). Governments and school administrators may help ensure that students in remote places receive a high-quality education by providing teachers in island communities with the internet access and resources they need. It was mentioned that equipping teachers with the new sets of skills is necessary when using and applying technology as well as redesigning learning to work with it is essential. In order to create technology-mediated lessons, the effectively use of ICT in

the classroom and keeping with the rapidly evolving technological landscape, the teachers must have their necessary training (Jimenez, 2005; Craciun & Bunoiu, 2015; Aslan & Zhu, 2018; Bensalem, 2019; Lim, 2007, as cited by Que, 2021). Moreover, Labiste, Jr. (2019) talks about the POWER UP program, which tries to enhance educational systems by emphasizing coastal culture in teacher training. Through education, the program also aims to empower these coastal communities by utilizing their cultural history for inclusive development. In one study on island school in the district of Concepcion, Iloilo mentioned that they have equipped themselves with the fundamental technology needs and educational resources required for instruction delivery. The teachers in the said area have participated in online class demonstration training and updated their online training skills



to demonstrate their readiness to handle and manage the class in the current circumstances (Sente & Gorriceta, 2021).

Teachers on the island face a lot of challenges in regards to teachers' abilities when instructing the students. To fill in the needs, more training and experience must be done properly. Also their effectiveness as individuals and as educators must be proper too. This was supported by the study conducted by Rodriguez (2022) in the island province of the Philippines in the Bangsamoro Autonomous Region for Muslim Mindanao (BARMM) called Basilan. Their study results showed that the academic institutions must prioritize continuous quality improvement because it fosters success and a healthy work-life balance. Besides, to integrate new teaching- learning trends, reinforcing the department heads' training and implementing quality assurance efforts

requires a budget, dedicated team, and established academic credentials. Furthermore, promptly attending to students' demands must assure high-quality service, the support system for ongoing quality development is guided by a structure most appropriate for educational establishments, and guarantees a common culture and better student service.

Additionally, teachers teaching on the island might affect their performance as stated in the study of Alovera and Ybañez (2020). It was mentioned in the research that was held in Panay Island that public secondary school teachers receive high and consistent social support, with varying levels of self-efficacy based on their socio-demographic profile. The level of social support varies based on factors like educational attainment, position, and length of service. Self- efficacy also



varies based on factors like sex, educational attainment, position, and length of service. The study also found a significant relationship between social support and self-efficacy, suggesting that teachers with high social support have high self-efficacy.

Experiences on the Island

The Philippines is a known country for being an archipelago. It is separated into three main areas consisting of Luzon, Visayas, and Mindanao (National Geographic, 2019). According to the study of Licuanan, Cabreira, and Aliño (2019), the Philippines is a diverse archipelago. It encounters challenges due to the "country's complex geologic history and geographic position, making the Philippines one of the most biologically diverse, most disaster-prone, and most environmentally threatened in the world." On the other hand, the said

country persists in being rich in resources, and the people living in the Philippines remain resilient. The authority's initiative on the situation was successful in getting the higher government to rehabilitate it. Still there is preservation and conservation needed for it. Moreover, disasters may occur throughout the Philippines because the island ecosystem was challenged by an increase in the amount of civilization's tasks. The reactive movement toward social development can take the initial action towards developing the society, which supports educational approaches. In addition to addressing the island's ecological limitations, the research also reveals how the residents there perceive unpredictable occurrences that they consistently experience, such as typhoons, storm surges, tidal shifts, flooding, shrinking mangroves, and floating trash (Valeroso & Ancheta, 2021).



As stated by Kallis, Stephanides, Bailey, Devine-Wright, Chalvatzis, and Bailey (2021), islands are becoming more popular as locations for renewable energy production. Achieving an equitable distribution of the costs and benefits of improvements on or near islands, as well as including local populations in installation ideas, present considerable problems. It was said that the technologies based on renewable energy have a lot of promise to lower costs while increasing sustainability and dependability. However, Bertheau (2020) argues that providing sustainable energy on its remote islands is a certain problem for nations like the Philippines.

Besides Lozano and Taboada (2021) mentioned that 2.7 million homes, primarily in rural areas, lack access to electricity in the Philippines. Even though the nation has undertaken several rural electrification

projects, research suggests that after a few years of operation, these initiatives are no longer financially viable. Island electricity can be difficult, particularly in inclement weather and during longer blackouts. Yet sometimes it takes a while for the power to be restored during shutdowns. Moreover, certain islands—small islands most frequently—do lack modern technology. The Philippines must depend on technologies for self-sufficient electricity production. Prioritizing renewable energy technologies such as geothermal, hydroelectric, solar, and wind power is one way forward (Castro, Delina, & Ocon, 2024).

Additionally, Hilvano et al. (2022) indicated that the interaction between and among islands fills the shortage of goods and resources. Though in the means of transportation, they struggle when it comes to the boat because sometimes it is not available and you



need to find someone to borrow. It makes it hard to go look and get resources needed. On the other hand, Hilvano et al. (2022) also added that people on the island who travel from one island to another island group to get resources are either using a boat; borrowing a boat from their friends, relatives, or neighbors, renting a boat, or riding in public transport. Hence, the degree of linkages among the island group serves as a safeguard during a disturbance by promoting resilience against challenges by ensuring continued access to resources or constraining its spread.

Problem Statement

This study explores the lived experiences of teachers assigned on Talim Island and how these experiences help contextualized katatagang-loob in performing their teaching duties and responsibilities?

METHODOLOGY

This study is qualitative in nature. The Interpretative Phenomenological Analysis (IPA) is the design utilized to emphasize the understanding of the katatagang-loob of the teachers at Talim Island.

As defined by Smith and Nizza (2022), IPA is a method used to fully understand the lived experiences of people. Also, how people interpret it within the context of their social and personal setting. Furthermore, the applied IPA in this study allows the researchers to delve deeply into the participants' perspectives through uncovering the meanings they attribute to their teaching experiences on Talim Island. This method makes it easier to understand specific challenges, accomplishments, and insights that teachers experience in this specific environment.



Research Locale

The study was conducted in one of the islands in the province of Rizal. As stated by a local resident living on the island for twenty-years, the main source of livelihood for this island is pangangisda at pagkakawayan. According to him, the supply of fish is declining due to the bad water on the lake, which leads them from having a hard time living and looking for a source of income. With this situation, residents are forced to leave and live on “mainland” to sustain their family. Additionally, in terms of education, it is complicated especially to the Barangay that has a rapid loss of electricity. Also, the long time complains of having slow internet connection that is not being resolved (J. S. Morano, personal communication, April 7, 2024). However, a barangay official in one barangay on Talim stated that life on the island is quiet, neat, and peaceful.

Their sources of income are fisheries, agriculture, and bamboo craft. In terms of education, people living on Talim are good, hardworking, and smart, as they believe that “education is the most powerful weapon” (E. Martinez, personal communication, April 8, 2024). This offers an opportunity for the researchers to start their research due to the participants meeting the required criteria needed for the study.

Key Informant Selection

The researchers used the purposive sampling method to gather informants for this study. Purposive sampling is a non-probability method, therefore, the researchers were allowed to select specific participants based on their expertise to evaluate their research questions and achieve objectives (Frost, 2022). The intended informants in this study are secondary teachers who teach solely on Talim Island, with twelve individuals involved.



The required qualifications for the informants are as follows: (a) they must be living outside Talim Island; (b) they must be licensed professional teachers; (c) they must have at least three years of experience in the teaching profession, considering the significant increase in teachers' effectiveness during their initial three years, followed by a period of stability afterward (Agsalud, 2017); (d) they must be teaching in secondary education as the majority of schools on Talim Island have a higher number of teachers at that level; and (e) they must have at least one month to thirty years of teaching experience on the island to be taken into consideration. This is to encompass a greater variety of viewpoints, including both early-career and highly experienced instructors. This set of standards guarantees a varied and perceptive portrayal of the experiences of educators on Talim Island.

In any case, informants who (a) are residents of Talim Island, (b) have less than three years of experience in the teaching profession, (c) are also teaching subjects other than secondary education, (d) have employment outside the island as their experiences and perspectives might differ significantly, and (e) are not willing to participate in the study will not be selected as informants. The researchers constructed these criteria to align with the goal of the study.

Research Ethics

The researchers comply with the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (2017) to guarantee the security of the researchers and the respondents. The ethical conduct of this study was taken into account, and the study will commence once it receives approval from the Institutional Review Board



(IRB). The gathered informants were determined purposively and adhered to the provided criterion constructed by the researchers. Accordingly, informed consent forms were acquired as the researchers properly briefed the informants regarding the risks and benefits of the study.

This research presents a carefully weighed balance between its benefits and risks. While the research does not pose direct threats to participants' lives, there is a potential risk of accidentally disclosing private information, compromising their privacy. To minimize these risks, participants can choose not to answer any uncomfortable questions. Despite these risks, the study offers significant benefits. For teachers on Talim Island, it promotes resilience and personal growth by enhancing awareness of coping mechanisms and *katatagang-loob*. Additionally, the study aims to identify teachers' unique

needs, guiding the creation of specialized support networks tailored to their circumstances. On a broader scale, the insights gained from this research can guide efforts to improve teacher well-being and academic outcomes. These improvements can influence educational institutions and policies, leading to broader systemic changes that benefit not only the educators but also their students and the educational system. By addressing the well-being of teachers, the study has the potential to create a more supportive and effective educational environment, contributing to the development and success of the entire community.

To maintain the confidentiality of the informants, they have the right to participate and withdraw from the study, employ anonymity, and be informed of the confidentiality limitations. Participants' autonomy is respected and they are encouraged to



express any concerns or boundaries throughout the study. Their well-being is the study's utmost priority, ensuring full support regardless of their decision to participate, withdraw at any point without consequence, or choose not to participate at all. Additionally, there are no excessive pressures or incentives to influence their decision to take part. The researchers ensured the protection of the informants' privacy by emphasizing the relevant mediums or instruments to be utilized and the setting or place where the interview would be held. The data gathering will take place in a secure, enclosed area on Talim Island. The setting has been chosen to prioritize the participants' comfort and convenience, providing a confidential environment where they can freely express their thoughts and experiences.

To ensure anonymity, substantial information will be anonymized using numbers as identifiers. Each

participant was assigned a distinctive number, which will substitute personal details in all documentation. Audio tapes, transcripts, and data files was labeled with these numbers instead of names or other identifying information to maintain confidentiality. Additionally, a secured folder on the personal computer of the principal investigator was used to store the key linking numbers to participant identities, accessible only to the researchers and their research adviser. Beneficence and non-maleficence were also applied, where the informants' foundation of dignity was acknowledged to guarantee welfare and prevent any possible harm that could be derived from participating in the study. The researchers also obtained institutional approval and handled any concerns and inquiries raised by the informants. All provisions mentioned in this section are also detailed in the informed consent form.



Research Instrument

In this study, a semi-structured interview was employed to ensure a comprehensive gathering of informative and relevant data. A semi-structured in-depth interview comprises open-ended discussions between the participant and the researcher supported by a flexible procedure and additional follow-up questions, probes, and responses (DeJonckheere & Vaughn, 2019). The researchers utilized a variety of tools, including open-ended questionnaires with orderly arranged guide questions. In order to gather information, the tool comprised seven initial questions with eight sub-questions to discuss the participants' background; eighteen intermediate questions with thirty sub-questions to discuss the participants' experiences; and seven final questions with one sub-question to discuss the career path in teaching on the island. The research tool is

made by the researchers which focused on exploring the katatagang-loob of teachers as they teach on the island of Talim. The interview guide questionnaires were validated by two RPms and one LPT. Additionally, a journal notebook for writing down the relevant information, and voice recorders for accuracy and data verification. The use of voice recorders will aid in transcription, quote referencing, and bias reduction, ensuring thorough responses and maintaining the exact words of participants.

Data Collection

The researchers planned every step of the study. The time and place where the interview was held under the convenience of the participant. When conducting the interview, all the requirements for data gathering were taken into account. To collect the information needed, (a) the



researchers prepared a validated questionnaire for the semi-structured interview. (b) The researchers looked for participants who met the required criteria. They were given a briefing to instruct them regarding the interview they conducted. Then (c) each participant was given an informed consent form. (d) In every participant, there was one researcher to facilitate the interview. The interviewer made sure that they covered all the questions and were answered during the allotted time. After conducting, (e) the researchers appropriately end the interview and remind the informants about their rights as respondents in this study. (f) The gathered data was transcribed and interpreted using the primary data alongside the secondary resources. Lastly, (g) the collected information were identified through numbers per informant. It is kept and stored in the secured folder of the personal computer of the principal

investigator wherein it is locked and only the researchers and their research adviser have the access to it. All of the collected information that was used in this study will be destroyed and deleted after one year.

Data Analysis

The study enables the researchers to grasp the instructors' real-world experiences in Talim Island education and gain a suitable level of insight into the phenomenon to supplement the specific knowledge of the context. Employing phenomenology studies using IPA that were formulated by Smith and Nizza (2021) to utilize the procedure. It was discussed that after the collection and transcription of data, the researchers began: (a) taking initial notes to guarantee clarity of the transcription and to start comprehending and considering all of the issues that the participants identified; (b) formulating experiential



statements to have an interpretative summary of what is happening in a specific portion of the text; (c) finding connections and clustering of experiential statements where examining participant statements for patterns to gain a deeper understanding; (d) compiling the table of personal experiential themes; (e) cross case analysis to look across every individual statements and look for similarities and differences between people, and; (f) if there are shared similarities that emerge in the collection of experiential themes, the group experiential themes are formulated. Lastly, (g) writing up a study where the analytical process continues by summarizing what is happening in the themes and discussing the researchers' interpretation.

Other Methodological Considerations

In regards to this study, there are some biases from the researchers. One of the researchers has a significant relationship with teachers. Also, there is one researcher who personally knew someone living on Talim Island. To lessen and ensure that the collected data is free from any biases, member-checking was employed to guarantee the reliability. According to the book of Creswell and Creswell (2018), this technique is used to determine the accuracy of the findings through a final report to the participants whether they feel that the gathered data is accurate or not. Conducting this would not imply that the raw transcription was checked; rather, the polished or semi-polished data is the one to be checked for accuracy. A follow-up interview with participants is also a part of this technique to provide them an



opportunity to check the accuracy of their data and to give feedback.

RESULTS AND DISCUSSION

The researchers derived the results from the interpretative phenomenological analysis of the participants' narratives. It revealed three central themes describing the lived experiences of teachers assigned on Talim Island, along with two central themes that contextualize their *katatagang-loob* in performing their teaching duties and responsibilities. These five central themes will collectively provide an understanding of how the teachers navigate their roles, challenges, and sources of resilience in a remote island setting.

Informants

The researchers gathered twelve participants that are all licensed teachers who are residing outside Talim Island. Each bringing diverse

backgrounds, teaching experiences, and subject specializations. The following are the informants:

1. A 46-year-old married man with a teaching position of Teacher III. He started in the year 2000 and he has been teaching for 24 years. The subjects he's handling are *Araling Panlipunan*, Science, and *Edukasyon sa Pagpapakatao* for Grades 7 and 8 students. He is also an office-in-charge and canteen manager;
2. A 38-year-old married man with the teaching position of Teacher I and has been teaching for 14 years. The subjects he handled before were Economics, Philippines History, and Asian Studies. While he currently teaches *Araling Panlipunan* and Contemporary Issues among Grade 10 students;



3. A 36 years old man with the teaching position of Teacher I and he has been teaching for 4 years. He handles specialized subjects such as PDL and Physical Education for Grades 11 and 12 students;
4. A 25-year-old woman with the position of Teacher I and has been working full-time for 3 years. Previously, she was in the Science department, but she is currently teaching Filipino. She teaches 5 classes of Filipino for Grade 9 students and has an advisory class, Grade 9 - Ruby;
5. A 37-year-old married man. He holds the position of Master Teacher I and has been working full-time for 6 years, following 8 years in elementary education. He currently teaches TVL and academic subjects to Grades 11 and 12 and has handled an advisory class in the past, though he does not currently;
6. A 26-year-old woman. She lives outside Talim Island, and currently resides in Calumpang, Binangonan, Rizal for 4 years. She holds the position of Special Science Teacher I and has been working full-time for 6 years. She teaches Science and Empowerment Technologies to Grades 11 and 12 students;
7. A 42-year-old married woman with the position of Teacher I and has been teaching for 1 year on Talim Island and has 8 years of teaching experience before that. She is handling 21st Century Literature from the Philippines and the World and *Filipino sa Piling Larang* among senior high school students;
8. A 25-year-old married man with the position of Teacher I and



has been teaching for almost two months on Talim Island but has been teaching for 3 years outside the island. The subjects he's handling are 21st Century Literature from the Philippines and the World and Oral Communication among senior high school students;

9. A 57 years old married woman with the position of Teacher II. She has been teaching on Talim Island for 20 years. Currently, she teaches senior high school students in which she handles the subject Introduction to the Philosophy of the Human Person;
10. A 31-year-old married woman and holds a position of Teacher II. She's a permanent teacher and has been teaching on Talim Island for 9 years as she's stationed in two different schools on the said island.

She's handling English subjects among Grade 7 students;

11. A 34-year-old married woman with a position of Teacher II. She's been teaching on Talim Island for 3 years as a permanent teacher. Her students are in Grade 11 as she teaches Oral Communication and Statistics; and
12. A 52-year-old married woman and holds a position as office-in-charge and a Teacher III in their school. She's been a permanent teacher there for 26 years. She teaches Practical Research 2, Entrepreneurship, and Fundamental of Accountancy and Business Management in senior high school.

Lived experiences of teachers assigned in Talim Island—Collaboration with Island



Residents

Teachers on Talim Island frequently mentioned that collaborating with the community acted as a central theme that delves into the enhancement of learning outcomes and nurtures supportive conditions where students can thrive academically and for oneself. It was demonstrated through their commitment to motivating students, along with the residents developing a strong solidarity among teachers and the island residents that turned into a vital aspect of the educational experience on Talim Island.

To ensure that the needs and aspirations of the community are continually met, the teachers and residents continue to collaborate through combined initiatives and efforts. This also strengthens community relations and effectively enhances the collective well-being of Talim Island residents. As teachers

actively engage with their community to promote support and shared goals in educational success, a collaborative environment was structured where education becomes a shared responsibility. This theme contributed and made their work more meaningful and eventually became a passion, shaped by their desire to become role models and advocates for students' dreams despite economic limitations.

Teaching Became a Passion by Shaping Students' Futures

This focuses on the fundamental principle that guides the teachers on the island as they navigate their roles in the community. It interprets how teachers demonstrate this compassion through their commitment to motivating students along with the residents and improving their quality of life.



Reasons on Becoming a Teacher

It expresses the recognition that their purpose aligns with serving the community, facilitating a passion for education that is rooted in their principles as they strive to provide opportunities for learning and personal development. It also highlights the idea for some that teaching was a calling that emerged despite the initial reluctance.

“Malasakit sa mga kapwa ko taga Talim. Matuto sila, mabago rin iyong pangangailangan nila sa pamamagitan ng pagbabasa nila. So ayon... Di naman— Dati kasi parang ang hirap ng buhay sa Talim Island tapos ilan lang nakakapagtapos ng pag-aaral— grade 6 lang and hindi nababago ang buhay. Ayon ang nangyayari kasi hindi nakapagtapos ng pag-aaral.” (Concern for my fellow residents of Talim. Let them learn, change their needs through reading. So that...not really—before life was really hard on

Talim Island, and only a few graduated—most only finished up to Grade 6, and their lives didn't change. That's what happens because they didn't finish their education) (I10, L36-41).

“Oo kasi diba dati sabi ko, diba sabi mo kung ito ba ang gusto ko? teaching—na-realize ko na dito pala talaga. Dito pala talaga ako dinala sa teaching kasi though hindi ko siya gusto nong una. Ah kaya pala ako naging teacher kasi dito pala talaga ako.” (Yes because I said before, didn't you say “Is this really what I want?” teaching—I realized that this is where I truly belong. I was brought to teaching, even though I didn't want it at first. Ah, that's why I became a teacher. This is where I'm meant to be) (I12, L257-260).

“So 'yong resiliency, 'yong katatagang-loob na sinasabi ay dapat stick ka sa moral mo, stick ka sa principles mo. Ang gawin mo dapat ay



i-inspire ang mga bata to do better.” (So that resiliency, that inner strength, means you should stick to your morals, stick to your principles. What you should do is inspire the children to do better) (I11, L193-195).

“Syempre ang importance ng teacher sa community ay kailangan magserve ka as model, kailangan maging ehemplo ka ng kabutihang asal at the same time so ang ah isa rin ay kailangan mong ah... magbahagi ng kaalaman mo at the same time makita sa iyo kung paano mo minold ang mga bata or hinubog ang mga bata hindi lang sa kaalaman but mas more on sa values formation ng bata ‘yung paghubog ng magandang ugali, kasi yung mga mabubuting ugali yun yung dadalhin nila para pagrating nila sa tamang edad o sa sa totoong life kumbaga yung may trabaho sila hindi matatagal yung mga good manners or mgavirtues.” (Of course, the importance of a teacher in the

community is to serve as a model, to be an example of good behavior at the same time, you need to... share your knowledge at the same time it should be evident how you have molded or shaped the children not only in academics but more importantly in their values formation in developing good character, because those good values are what they will carry with them as they reach the right age and step into real life where when they have jobs, those good manners and virtues will remain with them) (I1, L403-412).

Educators’ Goal for the Students’ Success

Educators on Talim Island aspires to empower students to pursue their dreams and overcome challenges through a holistic approach that encompasses emotional, spiritual, and academic growth.

“Kasi kung meron ka nung



katatagang-loob, kailangan
mai-integrate mo din sa mga bata...
mai-turo mo din, ma-instill mo din sa
kanila na ano... yung bagay na yun.”
(Because if you have that inner
strength, you need to be able to
integrate it into the children as well... to
teach and instill that quality in them)
(14, L426-429).

“Ayon nga...so, hindi lang dapat
ano... sabi nga noble na profession ito
so hindi lang dapat academic ang
maturo mo sa mga bata. So dapat
ma-touch mo muna yong ano nila—
emotional aspect nila. Then kailangan
maturuan mo rin sila na lumapit sa
Diyos.” (That's it...so, it shouldn't be
just... it's said that this is a noble
profession so you shouldn't only teach
academics to the children. So you
should also touch— their emotional
aspect. Then you also need to teach
them to come closer to God) (111,
L33-36).

“Pag nashe-share ko yung mga

yun sa mga estudyante, kung pano
yung ahm... pagsisikap ko noon nung
nagaaral ako, nai-inspire. Lalo dito sa
isla kasi syempre maraming ahm...
hindi pinalad pagdating sa ahm... sa
fortune dito sa isla. Marami talagang
mahirap ang buhay dito, so yung iba
nawawalan ng pag-asa mag-college,
hanggang high school lang, ayaw na
nila mag college kasi magastos, pero
yun nga... nabibigyan ko sila ng
awareness na maraming options para
matupad mo yung pangarap mo.”
(When I share those with the students,
about how my efforts when I was
studying, they feel inspired. Especially
here on the island because there are
many who are not fortunate here. Life
can be really hard for many people
here, so some lose hope of going to
college and think high school is
enough because college is expensive,
but I make them aware that there are
many options to achieve their dreams)
(16, L280-287).



“Siguro sa pag-encourage sa kanila. Meron kasi akong mantra sa klase ko eh. Ano 'yon? Try and know that you can. Mantra ko 'yon sa mga estudyante ko. Bago mo ayawan, bago mo hindian; subukan mo muna para malaman mo na— ah kaya ko pala. So ayon, kasi tayo diba meron tayong "ako nga kinaya ko" diba may mga ganyan tayo. “Tapos kayo ganyan lang,” hangga't maaari hindi ko ginaganyan ang mga estudyante ko. Basta ang lagi ko lang paalala sa kanila ay subukan niyo muna, Subukan niyo muna at saka niyo—kapag hindi talaga, ask for support pero huwag aayaw agad. Try niyo muna ganon.” (Maybe by encouraging them. I have a mantra in my class. What is it? Try and know that you can. That's my mantra to my students. Before you give up or say no to it; try it first so you'll find out— ah, I can do it. That's it, it's because we have "I handled it". "Then you're just

like that," as much as possible I try not to make my students feel that way. The only thing I always remind them is to try it first, Try it yourself first— if it really doesn't work, ask for support but don't give up right away. Just try it first) (110, L403-412).

Eagerness to Teach

This conveys the thought of viewing their profound love for their profession as an opportunity to make a lasting difference in their students' lives, provide quality education, and present the noble role that teachers play in contributing for a brighter future for the community.

“Kaya dapat pakita natin sa kanila na nandito lagi yung education system natin na kahit napakaraming challenges ng ating... government sa education system handang magturo ang mga teacher.” (So we must show them that our education system is always here that even though there



are so many challenges of our... government in the education system, the teachers are ready to teach) (12, L300-302).

“Kung ako’y kung papapiliin ng buhay ko next life eh pipiliin ko pa rin maging teacher.” (If I were to choose my life in the next life, I would still choose to be a teacher) (12, L400-401).

“See to it na may plan B ka para maideretso mo rin ‘yung pagtuturo mo that is being ah kumbaga yung parang resourceful kumbaga yung parang naruon yung yung aim na kailangang magpatuloy despite na may mga humahatak na hindi dapat pero mas nauuna yung pagiging kailangan malakas yung loob mo diba.” (See to it that you have a plan B so that you can also continue your teaching, that is being resourceful, and there is the aim of needing to continue despite those that are holding you down when they should not be, but what comes first is

having the necessary courage, right) (11, L386-390).

“Teaching is a hard profession actually muka lang siyang madali pero mahirap and kapag sa tingin mo ito ‘yung plano ni lord sayo then push for it. Hindi magiging madali ang process pero pag pinagkalooban ka ni lord, ibibigay nya sayo to. So sa mga gusto maging bagong teacher, kung ito talaga yung gusto niyo o yung plano nyo sa buhay then ilaban nyo talaga kahit na mahirap. Kasi ganon naman talaga kailangan mo ilaban ang pangarap mo.” (Teaching is a hard profession actually it looks easy but it's hard and if you think this is the Lord's plan for you then push for it. The process won't be easy, but if the Lord has blessed you, he will give it to you. So for those who want to be new teachers, if this is what you really want or the plan you have for your life then fight for it even if it's hard. Because that's how it is, you need to fight for



your dreams) (I8, L380-387).

Teachers and the Community Unite for Educational Success

Solidarity and collaboration among teachers and the community is a vital aspect of the educational experience on Talim Island, as teachers actively engage with their community to promote support and shared goals in educational success.

Community Engagement

It allows the exchange of ideas and resources, this active involvement confirms that the educational efforts are aligned with the community needs. Creating a coordinated environment where both students and residents feel valued and invested in academic progress.

“Ang community naman supportive rin naman sa... sa school” (The community is also supportive of... of the school) (I1, L91-92).

“So yung pagiiinteract sa sa sa mga residente since nga magkakakilala so halimbawa tatawag kami ng meeting ay magkukuan muna kami ng sulat kumbaga pipirma sila, iinform sila then pumupunta naman sila mostly lahat ay pumupunta gawa ng full support nga ang community sa school maganda ang samahan ng community at school” (So the interaction with the residents, since they know each other, so for example we will call a meeting first we will take a letter that they will sign, they will be informed, then they come mostly everyone comes because of the full support of the community to the school, the community and school have a good association) (I1, L96-100).

“So ayon kumbaga minsan yung mga residente dito mga ano sila mga approachable sila, pagdadaan ka dito o pag naglalakad kami naggo-good afternoon sila. Babatiin ka nila...tapos kami din tsaka magiliw din sila sa mga



ano lalo na sa mga taga bayan...ayon.” (So it seems that sometimes the residents here are approachable, when you pass by here or when we walk, they greet you with a good afternoon. They will greet you...and we too, and they are also friendly to others, especially to those people from the town....that's it) (17, L75-78).

“Unang una kasi kailangan kausapin yung parents, sumunod yung mga subject teacher. Ayun, yun lang” (First, it is needed to talk to the parents, followed by the subject teachers. That's it) (14, L335-336).

Social Interaction with Others

This aspect analyzes the ways teachers participate, engage, and connect with diverse individuals. It helps educators recharge and also refine their ability to relate to their students, creating an inclusive atmosphere and conducive to learning.

“Sa pagsama sa kanila, pag halimbawa nagyaya kumain, mag-rides” (When joining them, like when they are invited to eat or go on rides) (16, L75-76).

“Yung pinaka-recharge ko lang yung linggo...simbahan, pamilya” (The only day I get to recharge is Sunday...church, family) (14, L385-386).

“Natutulungan ako nun kung pano ka makiharap sa iba't-ibang uri ng tao” (It helps me learn how to deal with different kinds of people) (15, L214-215).

Lived experiences of teachers assigned in Talim Island—Teachers Support Network from their Surroundings

Beside that, another theme emerged was Teachers' Support Network from their Surroundings. This theme tackles that teachers received various support from different people



that enabled them to handle job demands and preserve their emotional well-being. Their spiritual practices were also mentioned as an essential source of support. They are also receiving support from their colleagues at work. Teachers on Talim Island characterize their support system at work as a close-knit staff and educators that constantly provide one another with direction, inspiration, and useful assistance. They highlight the ways in which senior colleagues and school administrators' professional development opportunities and mentoring promote cooperation and open communication. Beyond assisting them to cope up while working with limited resources, their supportive environment also reinforces their commitment to their responsibility as they teach on the island.

Their shared experiences unfolded their sense of unity and purpose to push through and remain dedicated to

their work. As well as their family support are one of the support systems they have. Their families give them both emotional support and practical help, which allows them to handle their professional and personal responsibilities. They also assist them with some school-related tasks during their family time when schedules are hectic. Along with that, their friends and other significant others offered further encouragement and empathy towards them. These connections extended them the mental strength and drive to overcome obstacles and remain dedicated to their jobs. The *katatagang-loob* they possessed made them committed to address the island's educational needs and is strengthened by this sense of mutual understanding, which also strengthens their capacity to come back after challenges. These support networks reinforce their *katatagang-loob* by reducing their stress, cultivated motivation, and



having a safety net to allow them to be resilient and steadfast despite work or personal challenges.

Spiritual Support

A teacher on Talim Island said that their spiritual practices, which are an essential source of support, are the source of their strength and determination.

“Nananalangin ako kasi kung hindi mo natanong, Born Again Christian si Ma'am *censored* . Naniniwala ako na ang lahat na kakayahan ay hindi lang sa atin galing, pinagkaloob o bigay din sa atin ni Lord” (I pray because, if you didn't know, Ma'am *censored* is a Born Again Christian. I believe that all our abilities do not just come from us but are granted or given to us by the Lord) (I10, L49-51).

Workplace Support System

In addition to the assistance they receive from their support system at

work in overcoming the difficulties of operating with few resources, this encouraging atmosphere strengthens their dedication and resilience.

“Syempre support system namin yung principal namin, yung mga department head namin...ayon sila yung nagbibigay sa amin ng mga insights kung ano yung mga dapat gawin tapos kung meron man ano open din sila, kausapin mo lang sila nagkakaliwanagan naman yung mga naliliwanagan yung mga katanungan kumbaga open” (Of course, our support system includes our principal and our department heads. They provide us with insights on what needs to be done, and if there are any questions, they are also open. You can talk to them, and things get clarified—questions are answered, so it's an open line of communication) (I7, L248-253).

“Pag may hindi ako naiintindihan especially kapag like for example,



pasahan na ng mga ganito o and involve yung math, eh punta na ako sa math teacher ganon.. communication is the key pa rin talaga” (If there's something I don't understand, especially when it's something like handing in assignments or when math is involved, I go straight to the math teacher. Communication is really the key) (I8, L227-230).

“Siguro, after work. Iyong mga kwentuhan, lokohan, small talk o kaya kapag habang kumakain ng lunch nagkwewentuhan. Kapag naman kailangan ng tulong, nagtatanong ako sakanila kung ano kaya ang pwedeng gawin” (Maybe after work. The conversations, jokes, small talk, or sometimes when we're having lunch, we chat. And when I need help, I ask them what can be done or what I can do) (I10, L292-295).

Relational Support System

Teachers on Talim Island

emphasize that the close connections they have with their families are the foundation of their relational support system. These connections provide them the mental strength and drive they need to overcome obstacles and remain dedicated to their jobs.

“Hindi nila ako inaabala yun yung isa hahaha hindi sila yung kung anong kukunin sa akin at the same time pag unawa ng ngayong pwedeng hindi ako makauwi malakas ang alon sa kinabukasan na yun yun yung mga instances na kung saan pinapakita ng family na talagang supportive sila saakin” (They don't bother me, that's one thing. They're not the type to ask for something from me, and at the same time, they understand when I might not be able to go home, like if the waves are strong the next day. Those are the instances where my family really shows how supportive they are of me) (I1, L314-319).

“Work smart sabi ko sa kaniya kasi



pag ikaw ay naiistress sa trabaho hindi trabaho yan, kasi dun ka magkakasakit eh, diba dapat gawin mong masaya yung ano trabaho para lagi kang nagpapasaya pag pumapasok, ganado kang pumasok, hindi 'yung ah lunes nanaman oh. Dapat pag masaya ka kasama ka kasunod na lahat yun, everything follows.” (I told him, 'Work smart.' Because if you're stressed out at work, that's not really work, you're just going to get sick, right? You should make your work enjoyable, so that every time you go in, you're excited and motivated, not thinking, 'Oh no, it's Monday again.' If you're happy, everything else will follow) (12, L330-335).

“Oo, mga fifty percent...hindi nga lang fifty percent eh, sobrang daming percent mula sa pamilya kasi diba... though, malaki 'yung oras natin na... namin na nailalaan dito sa trabaho, pero pag-uwi sa bahay syempre sila yung huhugutan mo ng lakas ng loob”

(Yes, about fifty percent...actually, it's not just fifty percent, it's a huge percentage coming from family because, you know, even though we spend a lot of time at work, when we get home, it's really them that we draw our strength and motivation from) (14, L364-367).

Lived experiences of teachers assigned in Talim Island—*Lifestyle Management of Teachers to Sustain Their Work-life Balance*

Moreover, the theme that arose too was Lifestyle Management of Teachers to Sustain their Work-life Balance which focuses on Talim Island teachers who explain that their lifestyle has a strong emphasis on adaptability and simplicity. They point out the significance of maintaining a balance between work and family obligations, realizing that doing so is essential to maintaining their well-being. Managing everyday life for these educators



involves taking a deliberate approach to setting priorities and making sure that both personal and professional commitments are fulfilled.

They highlight that leading a balanced lifestyle requires effective priority management. They are able to manage both work and personal obligations without feeling overburdened by carefully dividing their duties. Besides it helps them to stay on track with their tasks— for them, having a work-life balance allows them to boost their resiliency to cope up with the requirements for remote teaching. Also, the educators see self-care as essential to resilience and lifestyle management. According to them, it combines self-control, forming healthy routines, controlling emotions, and setting aside time for oneself. They can recharge and maintain their motivation by doing things like prioritizing their well-being and appreciating little achievements.

Teachers feel that looking after their well-being gives them the confidence to focus on managing the difficulties in their work setting.

Managing Priorities

They define this as having the capacity to efficiently manage their time, maintain a positive work-life balance, and distinguish between their personal and professional lives. In addition to keeping them on top of their work, teachers feel that these abilities help them become more resilient, which helps them deal with the difficulties of teaching remotely.

“Since dalawang araw nga lang ako rito ay I see to it na gagawin ko ng weekday ang yung mga report or kung ano mang ahh pagpoprovide ng mga yung mga instructional devices or yung mga IM's see to it na quality time ang aking weekend kasi two days ako sa family ko so ako ang magluluto tapos ay yun nga magsisimba kami minsan



kumakain sa labas para mamaximize ko 'yung konting oras ng two days na solely lang sa pamilya ko" (Since I'm only here for two days, I make sure to treat those as weekdays for tasks like reports or providing instructional materials and other work-related things. I make sure that my weekends are quality time, because I only have two days with my family. So, I'll cook for them, and then, of course, we go to church. Sometimes, we eat out to make the most of those two days that are just for my family) (11, L354-358).

"Meron pa akong time na...na ano na pagdating ko sa bahay nag-lalakad kami sa...namamasyal kami ng anak ko sa lugar namin nakakapag-bond pa kami yun napakahalaga ng time eh kasi hindi mo na mababalik 'yun, kaya habang may time ka, spend it sa mga taong mahalaga sayo. kasi hati na nga dito sa school, kaya pag sa family talagang dapat pag time. Mas gusto ko na nga magstay sa bahay tapos

kasama ko yung mga - dalawa kong anak tsaka asawa" (I still have time to...when I get home, we go for a walk or take a stroll around our neighborhood with my child. We get to bond, and that's really important because you can't get that time back. So, while you still have time, spend it with the people who matter to you. Since I'm already divided here at school, when it comes to family, I really make sure that when it's family time, I prefer staying home and being with my two kids and my spouse) (12, L380-387).

"Monday to Friday nagtuturo tayo papasok tayo ng 6:00 am until 2:00 pm, then the rest nun uuwi tayo ng bahay ay magpapakinig lang ng onti papakinig lang ng 'onti hahaha tapos ano lang kayo ng onti then gagawa naman tayo ng mga household chores then after that...'yun yunn daily routine ko ah then after that pupunta naman ako sa puntod ng mama ko tapos ayun



magpe-pray over tapos pupunta ako sa bahay tapos the rest check lang, family dinner together with my father, tapos ayun uwi na. Pero pagdating ng weekends, meron tayong wash day tapos Sabbath Day din diba tapos after nun pupunta tayo sa mga kamag-anak, sa mga relatives mo makikipag-bonding ka then pagdating ng friday ah yun yung dun yung mga friends ko may mgag show moment, may mga food trip moment the rest ganon uuwi na ng bahay then after ng sunday ah after ng Saturday, Sunday Lord's day ako so 'yun binibigyan ko siya ng time" (From Monday to Friday, I teach. I go to work at 6:00 am until 2:00 pm, then after that, I go home and just listen to a little music or something to unwind. After that, I do a few things, then I'll do some household chores. That's my daily routine. After that, I go to my mother's grave to pray, then I go back home. I just check things, then have dinner with my father. After

dinner, I go home and rest. But when the weekend comes, we have wash day, then it's Saturday, right? After that, I go to visit my relatives, spend time bonding with them. Then, on Fridays, I hang out with my friends—there's a show moment, food trips, and stuff like that. Then I go home after that. After Saturday and Sunday, Sunday is my Lord's day, so I give that time to Him) (13, L256-269).

“Pag nasa bahay ako sinisikap ko na hindi magcheck o maggawa ng mga any related sa school para atleast may balance ako .. alam ko yung priorities ko” (When I'm at home, I make sure not to check or do anything related to school so that I can have balance. I know my priorities) (18, L274-277).

“Hangga't maaari family time. Kung kinakailangan lang, hangga't maaari kapag umuuwi ako ng bahay family time. Lalo na ngayon na magkaka-baby na kami. Tapos kapag Sunday,



hindi pwedeng hindi magsisimba. Tapos kwentuhan sa family, sa mga kapatid ko” (As much as possible, it's family time. Only when necessary, but as much as possible, when I go home, it's family time. Especially now that we're expecting a baby. Then, on Sundays, it's a must to go to church. After that, we chatted with the family, with my siblings) (I10, L325- 328).

Self-care

According to them, this combines self-control, forming healthy routines, controlling emotions, and setting aside time for oneself. These techniques are crucial for these educators because they enable them to adjust to difficulties and preserve balance in their personal and professional life. They feel that taking care of yourself gives them the courage and focus they need to handle the challenges of teaching on the island.

“Kailangan kong maka mga six to

eight hours na dapat ang tulog ko yun. hindi ako masyadong nagpupuyat gawa ng iba kasi pagka hindi ka concentrated wala kang focus pag ka hindi ka ahh pagkapuyat ka at the same time siguro yung pagkain rin ng mga bawal since ngayon naman yay may maintenance ako” (I need to get around six to eight hours of sleep. I don't stay up too late because if you're not well-rested, you can't focus and stay concentrated. Also, I need to be careful with the food I eat now because I have maintenance medicine) (I1, L331-335).

“Free time nagzuzumba zumba ako kahit sa bahay kailangan kasi natin imaintain yung good health” (For my free time, I do Zumba, even at home. I need to maintain good health) (I9, L201-203).

Contextualizing Katatagang-loob in Performing their Teaching Duties and Responsibilities—Perspective



to Katatagang-loob Solely as Mainland (Tagabayan) Teachers

Furthermore, one of the themes that emerged to contextualize their *katatagang-loob* was Perspective to *Katatagang-loob* Solely as a Mainland (*tagabayan*) Teachers. This addresses the educators' experiences on how their *katatagang-loob* arose as teaching personnel on the island. Upon investigating, there are two subthemes under this theme, which are: teacher's role and job satisfaction. The teacher's role represents the different aspects of being a teacher on the island. In helping the students in their classes, teachers assist parents, work closely with other educators and participate in the larger island community. In addition to providing academic teaching, their responsibility includes promoting the community's emotional, social, and cultural development. As they adjusted to the difficulties of managing several

obligations while fostering community development. Teachers described teaching as a mission inspired by their sense of duty to the island community and the pupils, rather than just a job. They also emphasized the difficulties of teaching in an environment with limited resources.

Despite the challenges of teaching on an island, their drive and sense of purpose keep them persevering. Their *katatagang-loob* was strengthened by their dedication to their duty, which allowed them to grow and thrive in difficult situations. On the other hand, the teaching experiences they had on the island gave them a deep feeling of fulfillment, which enhanced their *katatagang-loob* and motivation. Teachers highlighted their accomplishments as important factors in their contentment, flexibility, growth in their careers, and personal development. Their duties and careers brought them satisfaction, and they



gained pleasure in being able to help the community and see their students grow. Their *katatagang-loob* is shown in their strong sense of duty, their view of teaching as a calling, and their patience and creativity in handling classroom challenges. Regardless of the problems, they find their job gratifying. Experiencing this different fulfillment of being a teacher on the island made them more motivated to continue despite the challenges—this reinforced their *katatagang-loob* as a teacher.

Teacher's Role

The teacher's role represents the different aspects of being a teacher on the island. In addition to helping the students in their classes, teachers assist parents, work closely with other educators, and participate in the larger island community. Participants frequently play several roles, such as community advocate, mentor,

counselor, and educator, all of which call for flexibility and resilience. In addition to providing academic teaching, their responsibility includes promoting the community's emotional, social, and cultural development. As they adjusted to the difficulties of managing several obligations while fostering community development, fulfilling these varied duties strengthened their resilience.

Teacher's Duty

Teachers emphasized the need to focus on students' development and engagement, which requires preparation, patience, guidance, responsibility, and creativity in handling difficult situations in the classroom. They developed *katatagang-loob* as a result of their dedication to their work.

“E di para sa learning ng bata despite na ayaw gustong umuuwi ka miski may bagyo, umuuwi ka kasi maalon” (It's for the child's learning,



despite not wanting to, you want to go even if there's a storm, you go because it's wavy) (11, L50-51).

“Ma-impart sa mga bata yung knowledge na nalalaman ko para mas mas mas meron silang new sets of learning pagdating ng tamang panahon” (Impart to the children the knowledge that I know so that they have more and more new sets of learning that come at the right time) (13, L37-39).

“Ayon yung ano ko tsaka ano sa estudyante ko na ano ako yung pangalawang magulang nila eh ganon” (That is my, and to my students that I am their second parent like that) (17, L36-38).

“So siguro, yung pagbibigay ng, or pagiging ano...role model sa kanila na kahit anumang hirap, makakayanan nyo din... kagaya... kung nalampasan ko nga, syempre malalampasan nyo din” (So maybe, giving, or being what... a role model to them that no

matter what the hardships are, you can handle them too...just like...if I've overcome it, of course, you can overcome it too) (14, L478-481).

“Bilang adviser kailangan mo magvisit lalo na yung mga ano...doon pa lang minsan kasi may bata na sa family problem ang inaano ang pinagmumulan ayon...minsan ano lang patnubay at gabay lang kasi minsan may mga bata na hindi mo napapansin mas nagaano sila, may mga bata naman na ano walang pake mga ganon pero yung kadalasan na absent minsan problema sa pamilya, minsan walang pambaon” (As an adviser, you have to visit especially the ones...even there sometimes because there is a child who has family problems, what is the source according to...sometimes there is only guidance and guidance because sometimes there are children that you don't notice how they are doing, there are child that don't care, but the one



who is usually absent is sometimes have a problem in the family, sometimes there is no allowance for school) (17, L422- 428).

“Paano nakikipag-uganayan? Syempre kailangan palabati. So ayan dapat hindi nalalayo 'yong sarili ko sakanila. Nakikipatungo ako sa kanila. Yung...ano ba? Sumasakay sa bangka, kung ano 'yong kinakain nila—nakikisama—ayon siguro 'yong term. Pakikitungo sa mga taga-Talim” (How to get along? Of course greetings are needed. So that's why I shouldn't be distant from them. I interact with them. The...what? Riding on a boat, what they eat—socialize with—maybe that's the term. Interacting with the people of Talim) (110, L94-98).

“Oo, maraming beses. Kailangan naming home visit kasi nga papa-bagsak na, kailangan mong habulin yung ano, mga subject teachers din, paki- usapan na bigyan ng activities

para makahabol. Ganun” (Yes, many times. We need a home visit because they are about to fail, you need to catch up on what, subject teachers too, plead to give activities to catch up. Like that) (14, L339- 342).

“Kasi ako bilang guro diba pag nandito na yung mga estudyante sayo na kasi nakaano yan eh kung ano man mangyari sa mga bata na hawak mo obligasyon mo yan pananagutan mo yan...kaya kumbaga ako hanggat maaari ako ahh una pa lang safety ng mga bata ang inaano ko” (Because I'm a teacher, right? When the students are here with you, that's how it is. Whatever happens to the children in your care, it's your obligation. It's your responsibility. I guess as long as ahh you prioritize the safety of the children that what I mean) (17, L240- 244).

“Syempre kailangan mong ano eh ano eh dudukot sa bulsa mo eh eto nga nasira laptop ko nung nakaraan hahaha nanghiram muna ako sa



school bibili ako pagkameron ng pera kumukuha kaming mga hulugang laptop eh ano kasi eh modern na nagbabago na dapat hindi ka na magdidikit ng manila paper basta diyan eh, pagpasok mo dapat syempre, buti nga dito may mga tv eh...” (Of course you need what will you dig into your pocket this my laptop broke a while ago hahaha I borrowed it from school for the meantime I'll buy it when I have money we're getting loaned laptops the reason is its already modern it should be change that you don't need to stick manila anymore paper just there, when you go to classroom of course, it's good that there are TVs here...) (I2, L152-157).

“Yes, kasi volunteer din ako sa community namin before so nakakapag-share kami ng libre, nagtuturo ka magbasa sa mga bata. By that ahh... hindi natin.. through that help binubuhay natin yung pag-asa at

kinabukasan ng mga bata” (Yes because I was also a volunteer in our community before so we were able to share for free, you teach children to read. By that ahh... we don't.. through that help we revive the hope and future of the children) (I8, L320-323).

“Mahalaga kasi papasok ka araw-araw kahit ganon ang sweldo pero iyong advocation ko para magturo. Iyong malasakit ko na mapagturo sa paraang makakaya ko” (It's important because you come in every day even if the salary is like that, but my advocation is to teach. I care to teach in the best way I can) (I10, L44-46).

“Kapag naka-connect ka sa kanila, minsan kasi kailangan ng connection doon sa teacher at doon sa student. Kapag nalaman mo yung background nila at lahat ng mga pinagdadaanan nila, good man or bad...ayun...malalaman mo din kung paano sila pakisamahan or



pakitunguhan” (When you connect with them, sometimes you need a connection between the teacher and the student. When you know their background and all the things they go through, good or bad...that's it...you will also know how to get along with them or treat them) (I4, L127-131).

Call of Duty

Participants described teaching as a mission inspired by their sense of duty to the island community and the pupils, rather than just a job. They talked about how despite the challenges of teaching on an island, their drive and sense of purpose keep them persevering.

“Una, sa pamilya nga tas yung pangalawa, sa mga bata. Kailangan mong pumasok kahit tamad na tamad ka, kahit nakakapagod, actually kasi araw araw bumabyahe uwi tas pasok na naman sa school tas uwi, eh yung oras pa naman ng byahe ay...one

hour, thirty minutes sa bangka tapos thirty minutes din sa mainland o sa land. Kaya yun, yung lakas ng loob galing sa pamilya at sa inspirasyon mula sa mga bata” (First, the family is the second, the children. You have to go even if you're lazy, even if it's tiring, actually because you travel home every day, go home and go to school again then home, and the time for the flight is... one hour, thirty minutes by boat and thirty minutes by mainland or on land. That's why, the courage came from the family and the inspiration from the children) (I4, L43-49).

“Ayun napunta ako dito...sa isla ng dahil doon. Pero...ano...minahal ko naman yung isla dito sa Subay, ang Catalino, kaya nagpatuloy na rin ako sa pagtuturo dito” (That's why I ended up here...on the island. But...what...I indeed loved the island here in Subay, Catalino, so I continued teaching here) (I4, L63-66).

“Nag-apply ako actually dito sa



may mainland kaso dito ako nailagay so ginrab ko na yung opportunity para makapagturo since gusto ko talaga magturo so hindi ko na inisip kung gaano siya kalayo, kung ano yung tatawirin ko, ang mahalaga makapagturo ako” (I actually applied here on the mainland but because I was placed here so I grabbed the opportunity to teach since I really want to teach so I didn't think about how far it is, what I will cross, the important thing is that I can teach) (18, L63-67).

“Para sa'kin bilang isang teacher is pag nakita kong successful yung mga estudyante ko. Kaya kahit...maraming problema at mahirap talagang magturo, maraming factors na nakakahadlang, ay...yun, iniisip ko na lang is gusto ko maging successful sila” (For me as a teacher is when I see my students successful. So even though...there are many problems and it's really difficult to teach, there are many factors that hinder...that, I just

think that I want them to be successful) (16, L194-198).

“Kasi yung travel, nakakapagod, yung sa bangka, tas yung dadatnan mo pa ditong estudyante, minsan hindi ganoon ka-ano, ka-taas 'yung mga respeto sa kanilang pananalita. So yun, tatagan nyo, sipagan nyo. At...i-ano nyo lang, yung pinakangi-priority nyo lang yung welfare ng mga estudyante. So ayun, kailangan ninyong maunawaan 'yung pangangailangan ng inyong mga estudyante, para maunawaan nyo 'yung isat isa” (Because the travel, it's tiring, the one on the boat, that's what you'll come to see with this student, sometimes it's not like that, the respect for their how they speak is so high. So that's it, be strong, work hard. And...just, the only thing you prioritize is the welfare of the students. So, you need to understand the needs of your students, so that you can understand each other) (14, L520-527).



Student and Classroom Dynamics

Participants talked about their experiences managing the classroom and establishing a positive learning environment. They talked about their efforts to maintain a healthy learning atmosphere, create meaningful connections, and balance student behavior. They emphasized the difficulties of teaching in an environment with limited resources and the various ways in which these experiences promoted resilience.

“Kasi diba yung mga bata iba iba, iba sa bahay, iba sa school so gusto ko yung ibibigay kong lesson na ah ang pagiging mabuting tao at pagiging estudyante hindi lang natatapos sa klase at bahay kailangan balance siya” (Because the children are different, different at home, different at school, so I want the lesson I will give is that being a good person and being a student doesn't just end in class and at home, it needs to be balanced) (18,

L40-44).

“Like na-appreciate pala nila yung mga tinuturo ko pala sa kanila ayon nakita ko sinuprise nila ako...ayon lang naman” (Like they appreciated what I was teaching them that as I saw they surprised me. That is all) (17, L112-114).

“Oo, maraming beses. Kailangan naming home visit kasi nga papa-bagsak na, kailangan mong habulin yung ano, mga subject teachers din, paki- usapan na bigyan ng activities para makahabol. Ganun” (Yes, many times. We need a home visit because they are about to fail, you need to catch up on what, subject teachers too, plead to give activities to catch up. Like that) (14, L339- 342).

“Pagdating mo dito sa school, sa classroom, pagharap mo sa students mo, dapat iwan mo muna yun. Syempre, madadamay kasi sila eh. Kapagka negative yung energy na dinala mo...mag...negative na rin yung



energy ng buong classroom” (When you come here to the school, to the classroom, when you face your students, you must leave that behind. Of course, they will get affected. When the energy you bring is negative...the energy of the entire classroom becomes negative) (I6, L133-137).

“Kapag nakapagturo ka ng maayos sa isang section na magulo. Kasi actually yung mga first one week ko dito medyo struggle magklase ng maayos...kasi may mga estudyante talaga ako na puro lalaki lang, yung makukulit talaga siya. So para sakin ahhh... kapag nakapagturo ka talaga ng maayos sa isang klase na yung set up is puro lalaki talaga accomplishment” (When you teach well in a messy section. Because actually during my first one week here, it was a bit of a struggle to go to class properly...because I actually have students who are all boys, the ones who are really stubborn. So for

me...when you can really teach well in a class that is all male it's really an accomplishment) (I8, L182-188).

“Siguro yung pag may control ka sa classroom yung mga strategies mo, approach mo sa bata, yung kailangan ano mo siya kailangan mag ano ka...kailangan gawin mo silang responsible” (Maybe when you have control in the classroom, your strategies, your approach to the child, what you need him to do, what you need to do...you need to make them responsible) (I2, L286-288).

Job Satisfaction as Mainland (Tagabayan) Teachers

Teachers highlighted their accomplishments as important factors in their contentment, flexibility, growth in their careers, and personal development. Their duties and careers brought them satisfaction, and they gained pleasure in being able to help the community and see their students



grow.

Teaching Achievement

An important aspect of the participants' job satisfaction was their accomplishments as teachers. Personal accomplishments, such as career advancement and flexibility, served as sources of motivation and pride. These achievements reinforced their *katatagang-loob* and strengthened their commitment to teaching.

“Mga naging estudyante namin na naging teacher na din siguro tapos ah merong magppm sayo na kundi sir nainspire ako sayo kaya ako nag-teacher yun ang pinaka ano eh pinaka di makikita sa certificate na kung ano anong mga bagay pero yung personal na ano nung bata na off the record yung sinasabi, yung kinukwento magiging masaya ka eh sa para sa kanila eh” (Our students who have become teachers too, and then ah

there someone messaging you like sir, I was inspired by you, that's why I became a teacher. That's the most important thing that can't be seen in the certificate, but that is what personal thing of the child who is off the record what is being said, what is being told, you will be happy for them) (I2, L238-244).

“Eto, na-promote ako. Tiyaga lang talaga, sa totoo lang, tiyaga lang. Tiyaga lang sa trabaho, tiyaga lang sa...pati sa pagpapa-ano mo sa professional growth mo” (Well, I got promoted. Just be patient, really, just be patient. Just be patient at work, just be patient in...even in what you do with your professional growth) (I5, L139-141).

“Isa sa accomplishment ko is yung kapagka, ayun nga, kahit masama ‘yung pakiramdam ko is nakakapasok ako sa school at nakakapagturo. Achievement na yun sakin, sa araw-araw na nakakapasok ako” (One



of my accomplishments is when, well, even though I don't feel well, I was able to go to school and teach. That's an achievement for me, every day that I go to school) (I6, L150-153).

"Hindi mo sila kailangang give up-an. Kasi...maaari silang magbago, so ayon. Yan yung mga dahilan din kung bakit nagiging matatag ang isang teacher, yun din yung nagiging achievement namin kapag marami kaming bata na na-inspire, nakapagpabago. Ngayon ay Grade 11 na sya" (You don't have to give them up. Because...they can change, so there. Those are also the reasons why a teacher becomes strong, that is also what becomes our achievement when we have many children who are inspired, able to change. Now, he is in Grade 11) (I4, L315-319).

"Last two weeks umuwi ako ng mga 2:30 ayon biglang ano umulan, inabot kami ng unos dito napadasal talaga ako...mahirap talaga 'pag

inabutan ayon lang yung pinakaano ko talaga pero so far sa school smooth naman yung akin.. nagagawa ko naman yung gampanin ko bilang guro, yung mga dapat kong gawin, magbigay sa mga estudyante ayon" (Last two weeks I went home at about 2:30 as it suddenly rained, a storm hit us here I really prayed...it was really hard when I was caught up that is all what I but so far at my school is smooth. I can do my responsibilities as a teacher, the things that I have to do, give to the students like that) (I7, L214-219).

"Nagi-improve din ako dito sa isla at...kaya ko pala yung mga bagay na nagagawa ko nung napunta ako dito sa isla. Kasi dati parang ano ako...mababa lang...low talaga, very low yung self-esteem ko, introverted ako...pero hindi ko alam kung bakit ko pinasok 'tong pagiging guro kasi diba kailangan mo ditong madaldal, maging open...ayun" (I am also improving here



on the island and...I actually can do the things that I was able to do when I was here on the island. Because I used to be like...just [low...my](#) self-esteem is really low, very low, I'm introverted...but I don't know why I got into being a teacher because you have to be talkative, be open...that's all) (14, L464-469).

“Iba, iba ‘yung mundo sa mainland, iba ‘yung mundo sa isla. Ang ano ko lang dito ay narealize ko dito na kailangan ano ahhh ano lang continue mo lang kung ano yung ginagawa mo dati sa una mong school. Ipagpatuloy mo lang tas dagdagan mo lang yung dapat mong idagdag. Halimbawa, syempre minsan iba-iba nga ‘yung pamamalakad ng school kailangan mabalance mo yung mga gawain” (Different, the world is different on the mainland, the world is different on the island. The only thing I have here is that I have realized here that the needed is to just continue what you

were doing before in your first school. Just keep adding what you need to add. For example, of course sometimes the management of the school is different, you have to balance the workload) (17, L401-408).

“So narealize ko natutunan ko na kaya ko pala na dapat hindi ako dumedepende sa kamag-anak kong teacher kundi sa sarili ko kasi unang bagay ikaw din yung makakadiscovers sa sarili mo kapag wala ka talagang kakilala at least hindi ka nape-pressure na gawin yung best mo kasi bago ka so bilang bago ibibigay mo talaga yung best mo kasi wala ka nga kasi talagang kakilala kumbaga feeling mo ijujudge ka nila, so we have to do our best whether may nakikita o wala” (So I realized I learned that I can do it, that I shouldn't depend on my relative teacher but on myself because the first thing is that you are the one that can discover yourself when you don't really know anyone, at least you are not



pressured to do your best because you're new. So as a newbie, you really have to give your best because you don't really know anyone, so you feel like they're going to judge you, so we have to do our best whether anyone sees it or not) (I8, L334-342).

“Narealize ko na nung una kasi hindi ko maano na dito tumira sa isla so as time pass by narealize ko na ano kaya ko pala akapin ang kultura ng mga taga isla, kaya ko at marami akong maitutulong sa isla” (I realized at first that I couldn't live here on the island, so as time passed by I realized that I can embrace the culture of the islanders, I can and I can help a lot on the island) (I9, L272- 275).

“Ano...matapang pala ako kasi ayon medyo duwag kasi si Ma'am. Pero ayon nga dahil sa alon, kailangan lumipat kami ng ibang barangay para maka-uwi kami sa bayan. Nakita ko na may iatatpang pa pala ako. Ayon ang na-realize ko, may itatapang pa pala

ako” (What...I was brave because Ma'am is a bit of a faint-hearted. But because of the wave, we had to move to another barangay so we could go back to town. I saw that I still had more to be brave. That's what I realized, I still have something to brave) (I10, L396-400).

“Five years from now, nakikita ko yung sarili ko na uhm...may bagong environment na...yun, bagong experience. Kasi syempre ayokong mag-stay sa comfort zone ko, kailangan mag...lumabas sa comfort zone para magkaroon ka ng growth, hindi lang personally, as professional din” (Five years from now, I see myself as...with a new environment...that's a new experience. Because of course I don't want to stay in my comfort zone, you need to...get out of the comfort zone so that you can grow, not only personally, but also as a professional) (I6, L341-345).

“Pero gusto ko din na maging



ano...yung matatag na teacher, kumbaga yung nilu-look up. Ayun yung more on ano akin...psychological or emotional, nilu-look up ng mga estudyante. "Eto si Ma'am, magaling 'to magturo or mabait 'to masyado" ganon. Ayon" (But I also want to be what...the strong teacher, the one to look up to. That's what's more about me...psychological or emotional, students look up. "Ma'am here, you're good at teaching or you're too kind" like that) (I4, L508-511).

"Memorable sa akin siguro 'yung binabalikan ako ng mga estudyante ko like hindi lang basta i mean maggegreat lang sila ng happy teachers day or birthday kapag feel lang nila kamustahin ako. Para sa aming teacher importante na kinakamusta din kami ng mga dati naming mga estudyante and nalalaman namin kung nasaan na sila ngayon...para sa akin wala ng ibang mas memorable kapag

nakakapagshare yung mga bata sayo...kunwari nasa college na sila yung mga learnings ba nila from you nababalikan pa rin nila" (Memorable to me is probably the fact that my students come back to me like it's not just that I mean they will only say happy teachers day or birthday when they feel like saying regards to me...for our teacher it is important that our former students also say regard to us and we get to know where they are now...for me there is nothing more memorable when the children can share with you...as if they are in college, do they still remember the learnings from you) (I8, L102-111).

Work Fulfillment

Experiencing this different fulfillment of being a teacher on the island made them more motivated to continue despite the challenges and this reinforced their resiliency as a teacher.



“Wala naman masyado. Kasi okay naman yung aming environment, okay naman yung mga kasamahan ko sa trabaho” (Nothing much. Because our environment is okay, my colleagues at work are okay) (I4, L323-325).

“Parang ‘yung bahagi na ng buhay ko yung yung pagtuturo na hindi rin ako magiging masaya kung hindi siya fulfilling kung kuwan ako ng material thing pero gusto ko’y [i-kuwan] ko rin yung craft ko hanggang ako ay magretire sinasabi ko iyon sa aking mga teacher talaga alam nila iyun nna maski tumama ako sa loto stil magtuturo ako ayun” (It seems like teaching is part of my life and I won't be happy if I don't have like...it is not fulfilling if like I'm material things, but I want to keep my craft until I retire. I really tell my teachers that. They know that, even if I won the lottery, I will still teach) (I1, L268-273).

“Siguro i could say na proud ako na nakapagturo ako nang

maayos...kapag naiisip ko yung profession ko kasi teacher ka. So kailangan mo talaga magturo” (Maybe I could say that I'm proud that I was able to teach well...when I think about my profession because you're a teacher. So you really have to teach) (I8, L196-199).

Contextualizing Katatagang-loob in Performing their Teaching Duties and Responsibilities—Contributing Factors that Emerge to Build Up their Katatagang-loob as Mainland (Tagabayan) Teachers

As teachers on Talim Island consistently chose to perform their duties for the benefit of their students, three phenomena emerged wherein their katatagang-loob is exhibited. It addresses their intrinsic motivation and the various challenges they encountered both inside and outside the school. Primarily, striving to continue their duty as mainland



(tagabayan) teachers express their determination and personal values that played a major role in helping them navigate through both professional and intrapersonal challenges. Furthermore, teachers also identified internal struggles within the school, such as supplemental duties, lack of resources, facilities, and educational needs inside the premise of their campus. On the other hand, various external difficulties increased the complexity of their duty, expanding further than classroom concerns to include safety and operational struggles.

These conflicts impact their daily routines and their resiliency (katatagang-loob) being continually exercised and deepened as they deal with the demands of their profession in a challenging environment. Their katatagang-loob grows from their purpose, faith, and desire to cultivate the community. It reflects how mainland (tagabayan) teachers adapt,

persevere, and remain committed to their role on Talim Island.

Internal Factors that Aligns with Personal Values

Participants' intrinsic motivation occurred due to their experiences as a mainland (tagabayan) teacher on an island.

Teacher's Katatagang-loob

Filipinos are known for being resilient. Whatever situation they went through, they will always find a way to rise up. With these, teachers showed their katatagang-loob as they continue to teach their students regardless of challenges.

"I think my resiliency sa pamamagitan ng pag-separate ng mga personal problems o issues sa pagtuturo sa mga estudyante kasi sila yong para hindi maapektuhan 'yong well-being nila. Kasi kaya nga sila nasa school para matuto, hindi para



maging taga-absorb ng problema ko na pinagdadaan. So ganong mindset—kapag nasa school teacher ako nila, second parent ako, hindi nila kailangan harapin mga problema ko” (I think there’s resiliency in separating the personal problems or issues when teaching the students; so that the student’s well-being won’t get affected. The reason why they are at school is to learn, not to absorb what problem I am going through. With this mindset, if in school I’m a teacher, their second parent, they don’t need to face my problem) (10, L315-321).

“Yong katatagan ko bilang guro, ‘yon ‘yong ngang may focus ka o meron kang naroon ‘yong pinaka nasa sustain mo kumbaga walang nagiging problema gawa ng nabigay mo yung best mo yung effort mo despite na maraming odds, maraming hindrances still nakafocus ka na kailangan may learning ang bata daily” (My resiliency as a teacher is where you have a

focus or you have sustainability. Like there will be no problems because you did your best and put an effort into it. Despite a lot of odds, many hindrances, you’re still focusing on the daily learning of your students) (11, L57-61).

“It matters. Kasi halimbawa naka-experience ka ng batang matigas ang ulo. Kung wala kang katatagang-loob, titigil ka na. Kung ikaw ay teacher na lelembot-lembot—ako nga humaharang pa sa nag-aaway eh” (It matters. For example, you experienced to deal with troublesome kid. If you don’t have resiliency, you’ll stop. If you’re a teacher who is soft—I am even pacifying the quarrel) (112, L225-228).

“Yong katatagan na natataglay, tinataglay araw-araw sa pagtuturo sa Talim Island ay magagamit ko sa dako paroon kapag ka na-promote o ninais ko na magkaroon ng...promotion sa



DepEd. Sabi nga diba, "The higher the positions, the higher the expectations." 'Yong resiliency na tinataglay, natataglay ko ay makakatulong para sa aking career development" (The possessed resiliency—the everyday resilience that I possessed whenever I teach on Talim Island can be used in the field if I got promoted or I wanted to get promoted in DepEd. They say, "The higher the positions, the higher the expectation." The resiliency that I possess will help me with my career development) (I10, L359-362, 364-365).

"Kung matatag ka kahit ano 'yung pagdaanan mo ilalaban mo. Kungbaga hindi mo bibitawan kasi kung wala ka non baka first day pa lang hindi na ako tumuloy sa pagtuturo kasi andon yung kaba, yung takot. Pero 'pag matatag ka mas magagawa mo yung bagay na—minsan nga umeextra ka pa habang kahit yung hindi mo trabaho nagagawa just to help the students" (If

you are resilient whatever struggles you're in, you must fight it. Like you won't let go because if you don't have the resiliency—you'll stop teaching on the first day because of nervousness and fear. But if you are resilient, you can do the things—sometimes you'll do extra work just to help your students) (I8, L280-286).

Determination

The participants display determination to remain and continue to work on the island after years of teaching and serving there.

"May mga times na sumasama yung pagod, yung emotions. Pero nandun pa din yung gusto mo magpatuloy kasi marami din umaasa sayo, hindi lang ano... parang walang puwang yung.. "mag-give up na 'ko, ayoko na sa isla", ganun. Kailangan, kailangan talaga, lalo na maraming bata. Ayun, yung pagpapatuloy din ito eh ng katatagang-loob, naka-depende



kasi sa mga tao sa paligid mo. Kapag alam mo na kailangang kailangan ka, tapos maraming ano...pag um-absent ka, maghahanap sayo mga bata, yung dadatnan mong mga bata, yung sitwasyon, ayun. Magpapatuloy ka kahit...kahit nahihirapan ka, ganun.” (There are times that are tiresome with emotions. But the urge to continue is still there because there’s a lot who are counting on me. There’s no room for the words, “I will give up, I don’t want to be on this island anymore.” It is needed, especially there’s a lot of children. That’s the continuation of resiliency—depends on the people around you. If you know that they really need you, and there’s a lot going on—and you’re absent, the students will look for you; those students you’ve come upon, and the situations. You should continue, even if you’re having a hard time) (I4, L242-251).

“Tumagal ako ng gan’to 14 years...hindi ko tinitignan yung hirap sa

pagtuturo. Mas tinitignan ko yung positive effect nito sa—kasi next generation kasi ang dinedevelop mo eh tsaka mga magiging anak mo sila—’yung mga susunod na next generation. Kaya kahit ano kahit mahirap ang teacher dapat patuloy na nandiyan para gabayan ang bata. Kasi ang ano ng teacher is second parent. Napakahalaga sa society” (I’ve been here for 14 years. I don’t see whether the teaching is hard. I looked at the positive effect of it because you’re developing the next generation—they are your children—the next generation. Even though it is hard, you must continue to guide them because the teacher is their second parent. Very important in society) (I2, L228-234).

“Nagkasabay kasi, nag-masters kasi ako, ayun...maraming ginagawa ganyan...puyat, ayun. Kahit wala akong tulog pumapasok ako para, syempre nanghihinayang ako sayang kasi yung isang araw na hindi ko



maituturo sa kanila yung dapat kong ituro pa sana” (I am taking my masters. There’s a lot of things to do and a lack of sleep. Even though I don’t have enough sleep, I still go to work because it is regrettable if I waste the day that should be allocated for teaching competency to the students) (16, L142-146).

Intrapersonal Challenges

Some participants tackle how they strive to continue their duty as mainland (tagabayan) teachers. It also showed their self-doubt and their longing for their family.

“Na-shock ako...kung baga kaya ko ba to kasi first time ko mapunta dito...sabi ko...napaisip din kung itutuloy ko ba pero ano naman sa isip ko lang yon pero hindi ko naman ano...ayon siguro pero ganoon naman ‘di ba ‘pag bago pa lang. Naninibago ka, nag-aadjust ka. Pero ako naman so far nakakapag-adjust naman na ako

ng ‘onti” (I’m shocked. Like I am asking myself if I can do it because it is my first time here. I’m saying...I also think I should continue, but it’s just what I think. I think it’s just because I’m new here and still adjusting. But I know to myself that I am adjusting little by little) (17, L61-66).

“Masaya magturo sa isla kasi ang mga estudyante dito ay mamabait kumpara sa mga kabayan kasi magkakamukha at magkakamag-anak” (It’s happy to teach on the island because the students are kind compare to the students at bayan [mainland]. Also, they look alike because they are relatives) (19, L78-80).

“Minsan may mga cases na nagsabi na nga rin ako sa Sir parang nahihirapan po kong na 25 years na out ako dito. Every weekend, two days lang ako sa family, five days ako sa isla pero sabi ng Sir ay tiyagain mo na gawa ng para sa bata” (Sometimes



there are some cases where I tell my Sir that I am having a hard time in my 25 years here. I'm with my family for two days during weekends and five days on the island. Although my Sir is telling me to persevere for the students) (I1, L276-280).

Internal Challenges that Mainland (Tagabayan) Teachers Faced Within the School

This will focus on the additional workloads, lack of resources, facilities, and educational needs inside the premise of their campus.

Supplemental Duties

The mainland (tagabayan) teachers are experiencing a lot of other duties aside from teaching. In this part, it will be displayed on how they act and their other role to sustain the needs of their students and the school.

“Akala ko talaga, akala ko dati nong bata ako madali lang ang

magturo. Pupunta ka lang sa unahan, ide-deliver mo lang ang lesson and lecture mo. So hindi pa pala don natatapos ang pagiging guro kasi pagka-ano...pagkatapos ng klase minsan may magme-message pa sayong mga estudyante. Sasabihin 'yong mga problema nila, hinaing nila. So, ang pagiging guro talaga ay pagiging lifetime. Hindi siya ano...wala siyang panahon. Wala nga siyang Sabado at Linggo actually” (I really thought...when I was a kid, I thought teaching was easy. You'll just go in front, delivering your lesson and lecture. However, being a teacher doesn't end there because after class for some time the students will still message you. They will share their problems, their complaints. Being a teacher is a lifetime. It's not that...there's no time. There's no Saturday and Sunday) (I11, L66-73).

“Meron kang administrative task. May ginagawan ka ng reports. Tapos



minsang kailangan mong mag-referee sa mga batang nag-aaway. Kapag nasugatan, nurse na rin kami. Kapag may masakit sa kanila, nurse 'yan. Di ko alam kung aware kayo pero kapag deworming, kami nagpapapurga. Teachers din bahala rin kapag nagpapurga. Kapag may sports kami pa rin. Napakaraming task ang binibigay sa mga teachers kaya napakahalaga ng resiliency kasi kapag wala 'yon—wala na, bibigay ka. Napakarami talagang task ang teachers hindi lang pagtuturo. Kaya kailangan talaga ng resiliency o katatagan kasi kapag walang resiliency, bibigay ang teacher. Emotionally and physically bibigay ang teacher” (You have administrative work. You’re doing a report. Then sometimes you will act as referee to those quarreling students. If someone is injured, we’re nursing them too. If they are sick, you’ll nurse them again. I don’t know if you are aware, but during

deworming, we’re the one who does that. If there’s sports, we’re still doing it. There’s a lot of tasks given to teachers, therefore, resilience is important. If you don’t have that—you’ll give up. There’s so many tasks given to a teacher, not just teaching. That’s why it is necessary to have resilience, if the teacher doesn’t have it, they will give up—both emotionally and physically) (I10, L214-224).

“Kung minsan as OIC nga minsan wala ang sir, ako ang humaharap sa kung may bisita, humaharap ako, ako kung minsan ang nag ahh kukuha ng mga report. Kung ‘yun yung isa—kumbaga yung naibibigay ko naman ng maayos ‘yung as officer-in-charge ng ng maayos—‘yung hinihingi kung bilang alternative sa school head. Sa isang banda rin may mga cases rin nagkakaroon ng problema ang bata. Say, may nag-away so ikaw rin ‘yung nag ah nagbibigay ng ah ng action or sanction



ruon sa bata kasi nga nasa iyo yung final desisyon. so may mga cases rin na say [auto]matic na may kulang na gan'to ay pinupunan naman or binigyan rin naman ng solusyon through run sa effort rin namin ng mga guro” (Sometimes, as OIC, I am the one who's facing the visitors if my Sir is not around and the one who'll get the report. If the other one—like I could give properly as an Officer-in-charge—as an alternative in school head. On the other hand, there are some cases wherein the child has a problem. Let's say, they are fighting. I am the one who also gives an action or sanction to the student because the final decision is on me. In Other cases, there's inadequate things, but it can be solved by the effort of teachers) (11, L246-256).

Methods in Teaching

Various teaching methods were done most of the time. To sustain the

learning process and needs of the students, the mainland (tagabayan) teachers used different ways of teaching.

“At first kasi ang ginagawa ko sa students, ano muna ako strict. Atsaka ako nagme-mellow ako pagkatapos. At doon na kami magkaka-ano...parang friends ganon pero meron pa ring ano...meron pa ring boundary” (I'm strict at first with my students. I mellow after some time. After that, me and my students became somewhat friends. Although there are still boundaries) (112, L69-72).

“Katulad nitong sa ICT room. Limited lang, ilang lang 'yan. Ang ginagawa ko is two is to one ay tama. Two students is to one computer. So parehas sila nagiging ano ang learning nila...collaborative. Sabi ko...ang instruction ko sa kanila magpalitan sila ng experience nila para sabay silang matutong magka-partner” (Just like this ICT room. There are few—very



limited. What I do is that in one computer, there are two students using it. Both of their learning became collaborative. My instruction to them is: exchange your experiences to one another so both of you will learn) (I11, L153-157).

“Nagpa-laboratory ako sa General Biology subject so...‘yung mga estudyante...mahirap kasi...wala pa kaming TV nung time na yon dun sa room, so ini-imagine lang nila ‘yung tinuturo ko, so ang naisip ko noon...bakit di ko gawing actual talaga para kung wala man kaming TV, at least may tangible experience sila. So bumili ako ng...ang topic namin noon is circulatory system and yung anatomy of the heart. So bumili ako ng puso ng baboy para sa kanila then dinissect namin ‘yon. Pagka-dissect ay pinag-recite ko sila kung ano ‘yung pagkakasunod sunod ng flow ng dugo sa heart. Ayun, kaya hanggang ngayon ay naniniwala ako na

natatandaan pa rin nila ‘yon kasi nagkaron sila ng ano...concrete na experience sa kanilang topic na ‘yon” (In my General Biology subject, we’re doing a laboratory...the students...it’s hard...that time, we don’t have a TV in our room yet. They are only imagining what I am discussing. I’m thinking...why not make it an actual since there’s no TV, at least they can have tangible experience. Hence, I bought...our topic was circulatory system and anatomy of the heart. So I bought a pig’s heart for them to dissect. We’ve done a recitation after that about the sequence of blood flow in the heart. I believe that until now they still remember it because they have a concrete experience in that topic) (I6, L61-72).

“Kapag academic kami, more on ano kami discussion. Pero kapag doon kami sa SMAW hindi kami papansinin nya mag-discuss kami, hindi kami papansinin nyan. So ang ginagawa



namin, activity tapos konting discuss. Syempre halimbawa 'yong alam mo na ang activity ipapaliwanag namin kung bakit naging ganon ang sagot don. Atsaka mag-a-assessment ulit sila, basta more on activity sila kapag SMAW ang ano namin kaharap namin” (For academic [students], teachers are more on discussion. However, if we’re dealing with SMAW (Shielded Metal Arc Welding), they won’t listen in our discussion. Instead, they lean more on activity after a brief discussion. For example, they will be doing an activity then we will discuss why it happens. Then another assessment again. If SMAW students, they are more on activity) (I11, L256- 262).

“Visual learners sila. Gusto nila may nakikita sila sa unahan para ma-engage sila sa lesson. So nong una talaga wala kaming TV so buti na lang dahil sa principal namin naisipan niyang i-prioritize na mag-purchase ng ano...ng TV. So simula noong

nagkaroon ng TV dito, makikita mo na ang mga bata magana na silang makinig. Talagang makikita mo na ang media ay may ano sa learning ng mga estudyante” (They are visual learners. They want to see something ahead of them to engage them in the lesson. So at first we really didn't have a TV, so it's a good thing because of our principal. She thought of prioritizing the purchase of something...a TV. So since there was a TV here, you can see that the children are now engaging more to listen. You can really see that the media has something in the students' learning) (I11, L169-175).

Teacher’s Challenges

This will show the struggles of teachers from mainland (tagabayan) to their students. It also addressed some of their sacrifices to deal with their students’ needs.

“[Sa] three years ko na pagtuturo...merong, naging advisory



ako na talagang napaka-gugulo, may...mahirap pero, sa palagay ko sila yung pinaka-sweet...na mga bata. So kahit na tingnan mo yung ano, yung mga negative nila, parang problemado 'tong mga batang 'to, pero hindi. Meron silang goodness bawat bata ay may goodness sa kanilang ano...sa kanilang personalidad o sa kanilang sarili” (I've been teaching for three years. There's something, I've been an advisor that's really very messy, there's...it's hard but, I think they're the sweetest...kids. So even if you look at their negatives, it seems like these children have problems, but no. They have goodness—every child has goodness in their what...in their personality or themselves) (I4, L82-87).

“Ngayon ang hawak ko ay senior high school. 'Yong word processing nila, 'yong microsoft word palang hirap na hirap na silang i-navigate. Ang nakikita kong dahilan, is ayon nga ang

kakulangan nila sa mga resources kagaya ng computer atsaka nong sa internet” (I am teaching in senior high school right now. Their word processing...even in Microsoft Word. They are having a hard time navigating it. The reason I see is the lack of resources such as computers and the internet) (I11, L131-135).

“Kung gusto talaga naming matuto nang maayos yung mga estudyante minsan hugot-bulsa ganon, sariling gastos para lang mabigyan namin ng hustisya ‘yung tinuturo namin” (If we really want the students to learn properly, sometimes we use our own money. Our own purchases if we really want to give justice in what we teach) (I6, L101-104).

“Kasi may mga Grade 7 students na—kahit mga Grade 7 na hirap pa rin magbasa. So extra mile or extra work po na after ko magturo o after ng teacher load ko naglalaan ako ng one to two hours para magturo sa mga



batang hindi marunong magbasa” (There are Grade 7 students that were—even though they are Grade 7, they are still having a hard time to read. I need to exert extra miles or extra work after my work or after my workload. I allocate one to two hours to tutor them how to read) (I10, L238-241).

“Sa pagtuturo, minsan brownout. Kapag brownout ang hirap” (In teaching, sometimes it was brownout. It’s hard if it’s brownout) (I10, L190).

Shortage of School Resources on the Island

Lack of school resources or materials does affect the teaching process of the teachers. In this part, it will show the various struggles of mainland (tagabayan) teachers from resources up to facility.

“Hindi kasi kapag wala naman kaming textbook, wala naman kaming module so may mga lesson naman na

soft copy na galing sa ibat-ibang school ayon ang ginagamit namin” (If we don’t have textbook, we don’t have module. So there are lessons that were in soft copy coming from different schools. That’s what we’re using) (I9, L125-127).

“Wala silang Science laboratories. Eh dahil Science teacher ako, nagtuturo ng Filipino, parang last last year ay hindi mo mabigay yung... pinaka-ano, maganda na learning experience. Conducive kumbaga, doon sa mga bata, yung pinaka-full na learning experience na mai-provide mo sa mga bata dahil sa kakulangan ng materials or supplies. Pero pagdating naman dito sa baba, kaya naman, though kulang kasi kami sa classroom kaya medyo mahirap. Parang magkakaroon nga kami ng shifting this second quarter dahil dun sa kakulangan ng buildings namin sa sobrang daming bata” (They don’t have Science laboratories. I am a



Science teacher, teaching a Filipino [subject], I think two years ago, I couldn't give...the proper teaching experience. Like conducive to the students...the full learning experience you can provide to the students since there is a lack in materials or supplies. But here in downside [annex], it can be...though there is a lack of classrooms that's why it's hard. We're having a shift in class this second quarter because of a lack of buildings due to the high population of students) (I4, L209-218).

“Wala kaming library. Nakaka-apekto 'yon sa learning ng mga bata. If you have...kapag wala kang, let's say laboratory, so nakakaapekto 'yon. Let's say gagamit sila ng telescope or something hindi nila nahahawakan talaga” (We don't have a library, and that affects the learning of the students. If you have—if you don't have, let's say laboratory...It is affecting. Let's say

they will be using a telescope or something...they can't really touch it) (I12, L116-119).

“So dapat example, one day lang siya na competency, nagiging two days ang isang competency para lang mapag-hands on ko sila. So may mga... may mga competencies talaga na nagsa-suffer kasi pinagha-hands on ko sila na dapat one day lang pero nagiging two days kasi nga share lang sila sa computer” (Example, it should be one-day competency. However, it became two days competency just to let them have hands-on experience. Instead of one day it becomes two days because they are sharing in [one] computer) (I11, L160-164).

“Hindi naman lahat may kakayahan kaya ako as a teacher minsan yung mga electric fan na ganyan pinapagawa ko nalang sa asawa ko kung kayang gawin” (Not everyone has a deeds. As a teacher, sometimes I let my husband fix the [broken]



electric fan if it can still be fixed) (17, L148-151).

“Actually sobrang init lalo na sa classroom namin 43 kami tapos isa lang ang electricfan lang ang gumagana...sobrang init po talaga” (Actually, it’s so hot in our classroom. We’re 43 [people] with one working electric fan...it’s really hot) (18, L202-204).

Educational Needs

The educational needs on Talim Island draw attention to significant obstacles that teachers and students face in their learning environment. The shortage of qualified teachers is a critical concern, which directly affects the quality of education.

“Kailangan maraming guro ang dalin dito para hindi kami mahirapan, mapaganda ang ating schoollike facilities—like, luma na...ayan ang mga issues at concern” (We need to have a lot of teachers here so that we

can make our school better—like facilities...it’s old ones. That’s the issues and concerns) (19, L285-287).

“Nasa edge kami ng cliff. Nagdo-double shift kami ngayon kasi ‘yong location nga ng school namin is nasa edge ng cliff. Hindi na kami pwedeng sabay-sabay na dalawang grade levels sa isang buong araw kasi nag-aalala na baka ayon nga...gumuho ‘yong lupa na kinakatayuan ng school” (We’re on the edge of the cliff. We’re doing double shifting because our school location is on the edge of the cliff. We can’t have two grades at the same time all day because we’re worried that the school will collapse) (110, L259, 261-265).

“Siguro mas makakatulong talaga kung may libreng internet din yung mga bata kasi ang access lalo na kapag senior high school may mga kailangan silang iresearch and kasi hindi lahat ng bata din may cellphone atleast may magamit silang computer



na magse-search sila kasi minsan may isa akong estudyante na magmo-modular kami, and hindi siya nakakagawa then I found out na wala pala siyang phone. So sana magkaroon ng at least computer na open para sa mga bata para makagawa sila ng mga assignment” (I think it will be helpful if there’s free internet access for the students, especially to the senior high school [students] since they need to research. Not all the students have their phone, [if there’s free internet] at least they can use the computer where they can search. There’s some time when we are having a modular, I have one student who can’t do their [activity]. Then I found out, they don’t have a phone. So I hope there will be at least a computer that is open to students so they can do their assignment) (I8, L362-370).

Organization Duties

Organizational duties within the educational setting on the island exhibits the innovative approaches done by teachers to address various struggles. To lessen this challenge, educators have adopted alternative solutions, allowing them to maintain a consistent teaching environment even during those difficult times.

“Kung minsan ay power supply so say, gusto mong mag powerpoint eh since wala ang kuryente eh di mo mai... maikuan yung pagtuturo mo so ang amin. ang ginawa namin ng alternative yun so yun nagkaroon kami ng solar” (Sometimes the power supply [interruption]. Say...you want to make use of powerpoint but there’s no electricity. You won’t be able to teach efficiently. So what we did is to have an alternative. We had solar [panel]) (I1, L150-153).

“Marami namang alternative na ginagawang ang school hindi kami



tumitigil na hanggang ruon lang, kumbaga gumagawa kami nga ng paraan kung, ang magiging problema ay...power supply so mayroon kaming alternative na mga mga strategy para maituro rin ng maayos the same time nga nag-put up kami ng mga solar batteries, solar panels sa school. Para kahit papaano ‘yung mga report at the same time yung mga ilang mga pagtuturo ay hindi magkaroon ng hindrance o hindi naging balakid sa pagtuturo ang kuryente ang power supply.” (There are a lot of alternatives that the school is still doing. We’re not stopping in just that. We’re doing it another way. If the problem is power supply, we have an alternative strategy for that so the teachers can still give a proper teaching. We also put up solar batteries, solar panels in school. For at least the reporting and at the same time, some of the teachings do not have a hindrance or the power supply has not been an obstacle to teaching)

(I1, L158-166).

“Nagkakaroon kami ng fundraising. For example, may zumba activity syempre magbebenta ng tickets, mga fun run, mga ganon. And yun nga, partnership with the LGUs” (We're having fundraising. For example, there is Zumba activity of course selling tickets, fun runs, etc. And also, partnership with the LGUs) (I6, L112-114).

External Challenges that Mainland (Tagabayan) Teachers Faced Outside the School

The teachers on Talim Island face a range of external challenges that increases the complexity of their work, expanding further than classroom concerns to include safety and operational struggles. These conflicts impact their daily routines and test their resilience as they deal with the demands of their profession in a challenging environment.



Transportation Struggles

Transportation going to and from Talim Island presents consistent challenges for educators. Limited boat schedules and weather conditions often disrupt their travel.

“So nong una talagang mahirap—ay hindi naman sa mahirap, okay na kinakabahan ako kasi hindi ako sanay sumakay ng bangka. Then nakasanayan ko na as time goes by. Kaya lang, nabalitaan niyo ba 'yong ano? 'Yong aksidente noong nakaraang taon. 'Yong may lumubog na bangka na may maraming namatay. So 'yon, nong nabalitaan ko 'yon, naisip ko na may possibility din na mangyari rin sa amin. Like for example, pagpupunta ako doon tapos malakas ang hangin. So, kapag pa naman malakas ang hangin hindi usually kina-cancel ang klase. So, natakot ako” (At first it was hard—not that hard, okay I was nervous because I am not used to riding a boat. Then I

got used to it as time went by. However, have you heard of the news? The accident last year. There was a sinking boat wherein a lot of people died. I heard that news, and I have a thought that it could also happen to us. Like for example, when we go there [at school] and the wind is strong. If the wind is strong, they don't usually cancel the class. That's why I got scared) (I11, L39-47).

“Siguro po transportation. Kasi nga sasakay kami ng tricycle o kaya jeep o ng bangka. Kapag may bagyo may pangamba ka kasi maalon. Number one ano namin alon. Kapag malaki ang alon, mahirap. Kailangan namin maglipat-lipat ng barangay para makasakay kami ng bangka” (I think the transportation. We're riding tricycles or jeeps or boats. If there's a typhoon, we're terrified because of the waves. Our number one [antagonist] is the waves. If there's a highwave, it's hard. We had to go from different



barangay just to ride a boat) (I10, L186-190).

“Kung may bagyo. Ayon talaga ‘yong...kapag may bagyo kasi, ano...ang hirap mag-byahe tapos kapag maulan...‘yon lang naman” (If there’s a typhoon, That’s really...if there’s a typhoon...it is so hard to travel since it’s raining) (I4, L222-223).

“Di ba bagyohan? E di sobrang lakas ng mga alon, deretso pasok kami tas inaabot kami dito...ng...suspension ng klase. Tapos, minsan nakakaawa din sa part namin, kasi kailangan pa naming magsolo. Alam nyo yung nagsolo sa may Navotas? Maliit na bangka para man lang makauwi, ganun” (It’s typhoon [season] so there is an extreme wave strength. When we reach the school, the suspension will happen [late]. Then sometimes it is pitiful on our part since we need to ride nagsolo. Do you know the nagsolo in Navotas? It’s a small boat so we can go home) (I4,

L270-275).

“Lalo na ‘yong gumaganon yung bangka syempre isa na ‘yon sa nagpapatatag sayo bilang guro kasi tungkulin mo yun serbisyo mo ‘yon, ‘yong malakas ang ulan, malaki ‘yong alon, malakas ‘yong hangin so ‘yon bilang isang guro na sumasakay ng bangka araw-araw. Isa ‘yun sa nagpapatatag talaga dahil gusto mong matuto ang mga bata na nag-aantay sa’yo para magturo” (Especially the boat when moving rapidly...that’s one of the reasons that will make you resilient as a teacher because it is your duty, your service. Heavy rains, big waves, gusty wind, so as a teacher who rides the boat everyday—that’s one of the reasons that will make you resilient if you really want to teach the students who are waiting for your lesson) (I3, L151-157).

“Kapag masama ‘yong panahon, hindi talaga kami nakakatawid. ‘Yon, ‘tsaka yung syempre yung safety ng



students kapag ganoon” (If it’s bad weather, it is really hard to travel. Also, the safety of the students if that happens) (I6, L164-166).

“Mahirap lang ‘pag tag-Amihan kasi malalaki ang alon, nakakatakot...water lily pa ang struggle pero ang pinaka-nakakatakot talaga is ‘yong alon” (It’s hard during northeast monsoon [Amihan] season because of big waves, it is scary...the water lily is also a struggle but the most terrifying is really the waves) (I7, L66-68).

Concerns About Scholar’s Return of Service

This will tackle the situations of mainland (tagabayan) teachers that were previously scholars that are assigned to teach on Talim Island for their return of service.

“Actually, hindi ko choice dito since DOST Scholar ako. Na-assign kami dito. So, hindi talaga ‘to yung choice ko. Dito lang talaga na-assign”

(Actually, this is not my choice but since I’m a DOST (Department of Science and Technology) scholar, we are assigned here. This is not really my choice. I’m assigned here) (I6, L36-38).

“Hindi ako dumaan sa interview kasi meron talaga akong slot dito since ‘yon ganoon talaga yung mga DOST Scholars. So, ang naranasan ko lang is yung pagsu-submit ng [mga] maraming requirements. Yun” (I didn’t do any interview since I have a slot here because that’s DOST Scholars are. So what I experienced was submitting a lot of requirements. That’s it) (I6, L41-44).

“Napunta ako kasi dito gawa ng sa DOST. Dito ako nalagay since yung sa DOST di ba, hindi ka naman makaka-pamilya kung saan ka basta nila ilagay dahil may return of service” (I got here because of DOST. I was assigned here because that’s what DOST is. You can’t just choose where



you can work since there's return of service) (I4, L61-63).

Conformity Issues

Some of the informants mentioned that they did not pick to teach on the island. They were assigned to a station where there's availability.

“Sa division office kung saan ka ilagay, doon ka. It's either mag-evade ka o hindi. Sayang ang ano...ang item. Pahirapan pa naman ang item ngayon sa division office. So grinab ko na kasi ano naman...kapag naka-five years ka na, pwede ka naman mag-request ng transfer” (In division office, if you are assigned in a certain station, then that's your station. It's either you will evade or not. It's wasteful...the item [work]. It's hard to get an item right now in the division office. So I grab it because if you teach there for five years, you can request to transfer you) (I11, L58-62).

“Hindi kami iyong namimili ng ano

ng station. Ia-assign kami kung saan may available na vacancy na station. Ngayon, nasa amin kung ita-take namin o hindi. Pero sa case ko, hindi naman ako humindi sa Lambac at doon ako na-assign. Nagpa-transfer ako sa mas malapit na na barangay” (We're didn't choose what station. We are assigned to wherever there's vacancy in stations. It's up to us if we will take it or not. In my case, I didn't say no in Lambac and that's where I was stationed. [And] I asked them to transfer me to a much closer barangay) (I10, L68-72).

“Nalipat ako dito for promotion. Island school, island” (I was appointed here because of promotion. Island school, island) (I5, L43).

“Sa isla naman ay ang problema ay depende sa division kung saan ka ilalagay...hindi kami ang namimili, division office ng Rizal” (The problem on the island is depending on the division [office] where they will assign



you...we're not the one who chose it, the division office of Rizal) (17, L47-49).

The findings highlighted the various aspects of teaching on Talim Island and how these shaped the teachers' professional identity, contributing to the formation and expression of their resilience. The themes illustrated that *katatagang-loob* serves as an enduring inner stance that guides how teachers interpret and respond to the demands of their profession in a challenging environment. These results offer a foundation for understanding how *katatagang-loob* emerges in their context.

The purpose of this study is to better understand the Filipino context of *katatagang-loob* of educators on Talim Island. In the findings of this study, it was shown that there are five displays of central themes that summarize the whole results. These include (1) collaboration with island

residents, (2) teachers support network from their surroundings, (3) lifestyle management of teachers to sustain their work-life balance, (4) perspective to *katatagang-loob* solely as a mainland (*tagabayan*) teacher, and (5) contributing factors that emerge to build up their *katatagang-loob* as a mainland (*tagabayan*) teacher. The mentioned central themes tackles the lived experiences and its role in contextualizing their *katatagang-loob* as they perform their jobs and responsibilities as a mainland (*tagabayan*) teacher on the island of Talim.

The central themes that discussed the lived experiences of mainland (*tagabayan*) teachers are (1) collaboration with island residents, (2) teachers support network from their surroundings, (3) lifestyle management of teachers to sustain their work-life balance.



It was shown in the collaboration with island residents that it consists of two sub themes namely: (1) teaching became a passion by shaping students' futures and (2) teachers and the community unite for educational success, which displayed during the investigation that there is a phenomenon wherein the mainland (tagabayan) teachers show care and empathy towards the students studying on the island. It also appeared that mainland (tagabayan) teachers had this certain goal for their students' success for their future. The reason they are doing their best in teaching is to prepare them once they enter college in one of many schools in the mainland (city). Additionally, the role of teachers and the community are important to the educational experience on Talim Island. It demonstrates their collaboration in actively involving in supporting the students in their education.

Second is the lifestyle Management of teachers to sustain their work-life balance wherein it deliberately puts up their well-being. They always make sure to prioritize their work-life balance. A proper management of their time is observed and even their self-care routine is done. Their personal and family time is important for them to keep them healthy and motivated. Having healthy habits, pampering day, celebrating small wins, and even doing zumba dance can make them easily adaptable to every challenge.

Moreover, the teachers support network from their surroundings focuses on their relationship with their family and friends, colleagues, and their religious engagement to God. To keep their well-being and resiliency in-tact, these three mentioned support networks where they rely serve a pivotal role in their life. In addition, it was stated by Baraquia (2022) that



social support groups, emotional support networks, and motivators are one of the elements in the development of teachers' resiliency. Support coming from the family and friends as well as their colleagues are significant to keep their composure and to prepare themselves whenever they travel across the island, provide lessons, and keep on with their duties. They also get another support through the face of motivation with the help of religious acts. One of the reasons for them to be able to continue to teach on the island is that they engage in religious activities such as attending mass every Sunday, reading bible verses, and doing devotions.

While on the other hand, the central themes that contextualized their katatagang-loob are (1) perspective to katatagang-loob as mainland (tagabayan) teachers and (2) contributing factors that emerge to build up their katatagang-loob as

mainland (tagabayan) teachers. For the perspective to katatagang-loob as mainland (tagabayan) teachers, it tackles their duties and responsibilities on the island where resiliency was shown. Despite facing difficulties, they used their katatagang-loob to continue their role as a teacher on the island. In spite of various challenges they are encountering on a daily basis, they still found happiness and satisfaction in their job. A study by Almagro and Flores (2023) suggested that teachers who see their careers as important, meaningful, and valuable are more likely to be resilient. Teachers from mainland (tagabayan) unveil their willingness to provide the best education they could provide to their students. They still find their job fulfilling.

Moving forward to another central theme which is contributing factors that emerge to build up their katatagang-loob as mainland



(tagabayan) teachers. Herein it discusses the internal factors that align with personal values to continue their teaching duties, which are determination, intrapersonal challenges, and the teachers' katatagang-loob (resiliency) itself. It tackles where they are coming from; persevering in the situation wherein the idea of giving up and self-doubting occurred but they still chose to stay and teach on the island. On the other hand, there are internal and external conflicts in the school premise. Whereas, internal challenges talk about the problems they are facing inside their school. The lack of resources, modules, materials, facilities like library, computers, and laboratories, buildings, internet, and power supply. Lozano and Tabaoda (2021) mentioned that 2.7 million homes in the Philippines, mostly in rural areas, do lack access to electricity. However, one school on the

island provides solar panels and batteries to resolve the power supply issue during class hours.

Moreover, the external factors that contribute to the struggles of teachers are their transportation, bad weather, return of service in scholarship, and conformity to the assigned station on their job. Whenever there's a typhoon in the area, the transportation becomes a hassle as they travel with heavy winds and big waves. Also, according to Hilvano et al. (2022), the lack of a vehicle (boat) because sometimes it's not available. During the investigation, there is a phenomenon wherein they share their experiences about riding a boat. There are times where there is no available vehicle for them to ride on. Which leads them to go to another barangay (district/ward) to look if there's an available boat for them to ride on. Furthermore, mainland (tagabayan) teachers who were previously scholars



are assigned to the islands for the return of service. According to Republic Act No. 10612 (2013), “Award recipients must teach full-time high school subject(s) in Mathematics, Biology, Chemistry, or Physics; or Information Technology or Agricultural, Aquaculture or Fisheries Technology, both in the university and technical-vocational tracks in the secondary education curriculum, for a minimum of two years, in a public or private high school.” This case is the same for the teachers under DepEd in Rizal—the division office is in charge of assigning the teachers where they can station depending on the availability. Given all this phenomenon that were observed during the investigation, the mainland (tagabayan) teachers’ katatagang-loob thrived because of their personal experiences as they manage and perform their responsibilities, interpersonal relationships with their

students and colleagues, and different obstacles.

In addition, Alejo (2018) “loob ng tao” theory is a union of abot-kaya (extent of strength), abot-malay (extent of consciousness), and abot-dama (extent of feeling). The educators embody the principles of “loob ng tao” theory through their experiences. First, the teachers are deeply involved not only in teaching but also in fostering a supportive and collaborative environment with the island residents. This engagement emphasizes how teachers embrace a shared responsibility for student success and community well-being, which is an essential part of their lived experience on the island. Second, these experiences contextualize katatagang-loob by demonstrating how teachers reinforce strength from their commitment to both their students and the community, thus addressing how resilience is contextualized in their



teaching performance.

Lastly, the experiences of teachers align with *abot-kaya*, as teachers take on various roles and responsibilities beyond academics, showing dedication to their students and community. *Abot-malay* is seen in their eagerness to teach and empower students despite challenges, while *abot-dama* is demonstrated through their empathy and understanding of the community's needs, which motivates their active engagement and sustained commitment to the island's development. All in all, their duties as a teacher, lifestyle, and support network work together to contribute to the lived experience of mainland (*tagabayan*) teachers teaching on Talim Island. While both of their personal and general struggles as they teach on the island put up to contextualize their *katatagang-loob* (*resiliency*).

All in all, this study unveils where

the *katatagang-loob* of teachers originated. It was actually contextualized from their live experiences as they teach on the island. Their experiences not just solely as a teacher, but also as an individual who go back and forth everyday. In contrast to common Western notions of resilience, *katatagang-loob* reflects a local form of inner strength shaped by their daily experiences whenever they travel and teach on the island. The *katatagang-loob* that occurs has significance for the teachers as they face limited resources, in remote locations, and has unique cultural demands. In circumstances like these, the possessed *katatagang-loob* of teachers are used not just to adapt to the challenges but also to adjust their teaching style since they need to assure to meet the needs of diverse learners. By demonstrating their *katatagang-loob*, the teachers remain



patient, motivated, innovative, inspired, goal-driven, and culturally sensitive even in situations they are being challenged. Even though the teachers are not specifically living on the island, they made sure to give their best to provide an inclusive and accessible quality education for their students.

CONCLUSION

Katatagang-loob is a profound kind of inner resilience that enables people—especially Talim Island teachers living from the mainland (tagabayan)—to persevere and prosper in the face of adversity. Personal motivation, support systems, spirituality, and a sense of moral and ethical obligation are its main sources of energy. Teachers, who are motivated by a purpose-centered attitude and emotional stability, demonstrate this katatagang-loob by means of their dedication to their

students and the community. This idea that combines courage, tenacity, and a clear purpose, empowers teachers to overcome challenges and speak up for themselves, their students, and the community in general.

The findings relevant to the objective of the study is to provide detailed results and insights into the katatagang-loob of teachers in the Filipino context, particularly regarding the lived experiences of teachers on Talim Island and their interiority or inner character (loob). Utilizing semi-structured interviews and analyzing the gathered data through interpretative phenomenological analysis, the researchers concluded that the lived experiences of teachers assigned to Talim Island assisted in contextualizing their katatagang-loob in performing their teaching duties and responsibilities. In addition, the results revealed that katatagang-loob among the educators is interconnected with



the dimensions outlined in “loob ng tao” theory—acknowledgment of responsibilities (abot-kaya), willingness to serve (abot-malay), and empathy for the community (abot-dama).

To summarize, understanding teachers’ drive to achieve can be rooted in their loob, which becomes evident through their lived experiences while performing teaching duties on Talim Island. Furthermore, the application of “Loob ng Tao” theory presents that these experiences cultivate resilience, thus explaining how the Filipino context of katatagang-loob emerged from teaching on Talim Island. Through integrating the theory with the lived experiences of teachers as gathered from the data, the researchers explored how the katatagang-loob of teachers working on Talim Island builds up. As a final observation, the teachers on Talim Island establish a unique form of katatagang-loob, their

real-world experiences on the teaching profession integrated to their loob or inner character as they balance multiple roles, foster meaningful connections with the community, and adapt to challenges.

The study provides valuable insights into the context of katatagang-loob of teachers on Talim Island. The importance of limitations and weaknesses are to be acknowledged, which presents opportunities for future research and methodological refinement. One significant limitation was the focus of the study. By concentrating only on the teachers from Talim Island, the findings may not fully capture the experience of educators in other remote or island schools across the Philippines. Future research may expand the scope of different locations, enabling a more comprehensive understanding of how katatagang-loob varies across different



contexts. Another limitation lies in the sample size and selection. The study involved a relatively small and similar group of participants, which could affect the reliability of the findings. Expanding the sample size and including a wider range of participants in terms of age, gender, teaching experience, and educational background could provide richer and more distinct perspectives on the resiliency of teachers. Also, it showcased an immense gap in the participants' length of experiences. Therefore, the years of teaching experiences on the island must be taken into consideration in order to distinguish the katatagang- loob of beginning and experienced teachers. Moreover, with the use of thematic analysis in the qualitative approach to explore diverse subjects, identify patterns across the data, and generalize the broader context and population. Additionally, adding a

quantitative method to support the qualitative context of the study.

In investigating how katatagang-loob changes over time among teachers on Talim Island, it is recommended that long-term research must be conducted. Gaining knowledge about the long-term impacts of resilience-building treatments can assist improve, understand, and refine approaches to support the teachers' performance, well-being in challenging experiences, and to their resiliency.

REFERENCES

- Agsalud, P. L. (2017). Teaching effectiveness of the teacher education faculty members in Pangasinan State University Asingan Campus, Philippines. *Asia Pacific Journal of Multidisciplinary Research*, 5(1), 16–22.
- Alejo, A. E., & Riddle, J. E. (2018). Loob as relational interiority: A



- contribution to the philosophy of the human person. *Social Transformations: Journal of the Global South*, 6(1), Article 29.
- Almagro, R. E., & Flores, L. C. (2023). Teacher's work values in public schools: The influence of web-based professional development to self efficacy and resilience in Davao Region. https://www.preprints.org/frontend/manuscript/1aac35f62fe8994a0775667e3df48d6f/download_pub
- Alovera, A. A., & Ybañez, E. B. (2020). Social support and self-efficacy of secondary teachers in Panay Island. *CPC School of Graduates Research Journal*, 19(1), 1-27.
- American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct in American Psychological Association*. <https://www.apa.org/ethics/code/ethics-code-2017.pdf>
- Bai, N. (2023). *Educational challenges in the Philippines*. Philippine Institute for Development Studies.
- Baraquia, L. (2022). Teachers' coping strategies with the challenges in the Department of Education: A phenomenological study. *SSRN*.
- Bertheau, P. (2020). Assessing the impact of renewable energy on local development and the sustainable development goals: Insights from a small Philippine island. *Technological Forecasting and Social Change*, 153, Article 119919.
- Borilla, W. R. (2022). *Adversity quotient and emotional intelligence of selected public-school special education teachers amidst the pandemic* (Mater's thesis, Fear Eastern University). https://www.peaklearning.com/wp-content/uploads/2022/06/PEAK_GRI_Borilla_May-2022.pdf



- Castro, M. T., Delina, L. L., & Ocon, J. D. (2024). Transition pathways to 100% renewable energy in 208 island mini-grids in the Philippines. *Energy Strategy Reviews*, 52, Article 101315.
- Creswell, J. W., & Cresswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications, Inc.
- DeJonckheere, M., & Vaughn, L. M. (2019). Semistructured interviewing in primary care research: A balance of relationship and rigour. *Family Medicine and Community Health*, 7(2).
- Estacio, L. O. (2020). A study on resilience: Positive response to risk and adversity among high school students. *Journal of the Asian Graduate College*, 4.
- Felisilda, J. (2023). *Surviving or thriving: The resiliency and well-being of filipino public school teachers during the pandemic times*.
https://www.researchgate.net/publication/367406097_Surviving_or_Thriving_The_Resiliency_and_Well-being_of_Filipino_Public_School_Teachers_During_the_Pandemic_Times
- Fonte, R. J. B., Yazon, A. D., Tan, C. S., Buenvenida, L. P., & Bandy, M. M. (2021). Distance learning delivery modalities implementation, resilience quotient, and work performance of teachers: A correlational study in the Philippines. *International Journal of Theory and Application in Elementary and Secondary School Education*, 3(2), 171–181.
- Frost, J. (2022). *Purposive sampling: Definition & examples*. Statistics by Jim.
<https://statisticsbyjim.com/basics/purposive-sampling>



- GMA Public Affairs. (2018). *I-Witness: 'Ang unang maestra,' dokumentaryo ni Sandra Aguinaldo (full episode)* [Video]. YouTube. <https://www.youtube.com/watch?v=3MGLtINfsgo>
- Hilvano, N. F., Pulhin, J. M., Bantayan, N. C., & Nelson, G. L. M. (2022). Small island spatial accessibility: The case of San Vicente, Northern Samar, Philippines. *Journal of Marine Island Cultures*, 11(1).
- Judilla, L., & Rellon, J. (2022). Teacher resilience and professional development trainings as predictors of teaching capacity in public schools: A convergent approach. *Southeast Asian Journal of Multidisciplinary Studies*.
- Kallis, G., Stephanides, P., Bailey, E., Devine-Wright, P., Chalvatzis, K., & Bailey, I. (2021). The challenges of engaging island communities: Lessons on renewable energy from a review of 17 case studies. *Energy Research & Social Science*, 81, Article 102257.
- Labiste, Jr., J. L. (2019, June 11). *POWER UP: Bringing UPV's commitment to public service to coastal communities through education*. University of the Philippines Visayas. https://www.upv.edu.ph/index.php/news/power-up-bringing-upv-s-commitment-to-public-service-to-coastal-communities-through-education?fbclid=IwAR1XTrt_KN8fefDjd8oFb6L9ZZrg9Z_UGLs73h8-8FSF2MkyV8l%20_svSysw
- Lacaba, T. V. G., Lacaba, A. B., & Caliwan, M. A. (2020). Teachers' resilience: A challenge of commitment and effectiveness. *International Journal of Research-GRANTHAALAYAH*, 8(4), 79–88.
- Licuanan, W. Y., Cabreira, R. W., & Aliño, P. M. (2019). Chapter 23 - The Philippines. In C. Sheppard



- (Ed.), *World seas: An environmental evaluation* (2nd ed., pp. 515-537). Academic Press.
- Lizana, P. A., Vega-Fernandez, G., Gomez-Bruton, A., Leyton, B., & Lera, L. (2021). Impact of the COVID-19 pandemic on teacher quality of life: A longitudinal study from before and during the health crisis. *International Journal of Environmental Research and Public Health*, 18(7), Article 3764.
- Lozano, L., & Taboada, E. B. (2021). Elucidating the challenges and risks of rural island electrification from the end-users' perspective: A case study in the Philippines. *Energy Policy*, 150, Article 112143.
- National Geographic. (2019). *Know before you go: The Philippines*. <https://www.nationalgeographic.com/travel/article/partner-content-know-before-you-go-the-philippines>
- Pe-Pua, R. (2018). *Handbuk ng sikolohiyang pilipino*. University of the Philippines Press.
- Professional Regulation Commission. (2023). *March 2023 results of licensure examination for professional teachers released in forty-two (42) working days*. <https://www.prc.gov.ph/index.php/article/march-2023-results-licensure-examination-professional-teachers-released-forty-two-42>
- Que, E. N. (2021). Sustaining successful ICT integration in remote rural schools. *Pertanika Journal of Social Sciences and Humanities*, 29(3).
- Republic Act No. 10612. (2013). Senate of the Philippines. https://web.senate.gov.ph/republic_acts/ra%2010612.pdf
- Rodriguez, R. L. (2022). An assessment of the practices on continuous quality improvement (CQI) among teacher education



- institutions in Basilan, Philippines. *Open Journal of Social Sciences*, 10(05), 241–264.
- Sente, L. S., & Gorriceta, I. (2021). Teaching readiness and capability of island school teachers in the district of Concepcion Iloilo. *Proceeding of the International Conference on Family Business and Entrepreneurship*, 2(1). <https://www.mendeley.com/catalogue/e06e04b3-6037-3239-aea3-80c9765bc88d/>
- Smith, J. A., & Nizza, I. (2021). *Essentials of interpretative phenomenological analysis* [Video]. YouTube. <https://youtu.be/5YM8Xxs8ucA>
- Smith, J. A., & Nizza, I. E. (2022). *What is interpretative phenomenological analysis?* American Psychological Association.
- Suson, D. (2020, October 6). *Teachers ride waves in Mindanao to bring education materials to island communities*. LiCAS.news <https://philippines.licas.news/2020/10/06/teachers-ride-waves-in-mindanao-to-bring-education-materials-to-island-communities/>
- Tiangco, A. N. (2005). Understanding the Filipino philosophy of resiliency: Katatagang-loob and its phenomenological consideration. In G. McLean & R. Gripaldo (Eds.), *Man and nature: The Chinese tradition and the future* (pp. 57-76). The Council for Research in Values and Philosophy.
- Valeroso, J. C. C., & Ancheta, A. (2021). Vulnerable lived experiences of the locals of Babatnin Island, Philippines. *Journal of Nature Studies*, 20(1), 44–53.



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***Water insecurity in the Philippines: Exploring socioeconomic
burdens and social enterprise solutions***

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ABSTRACT

Water insecurity remains one of the most pressing yet underexamined challenges in the Philippines, where millions of households continue to struggle to access safe, reliable, and affordable water, despite the country's rapid economic growth. This study examines the hidden socioeconomic costs of water insecurity, specifically its effects on household spending, public health, education, and productivity. Using a mixed-methods design, the research combines regression analysis of water-related indicators and waterborne disease incidence with qualitative case studies of both Philippine and international social enterprises. Results show that low-income households disproportionately shoulder high costs, face heightened vulnerability to illnesses such as diarrhea, leptospirosis, and typhoid, and experience lasting setbacks in human capital development. Evidence from initiatives such as WaterHope Inc., Manila Water's public-private partnerships, and community cooperatives illustrates that social enterprises can close service gaps by delivering affordable, inclusive, and resilient water solutions. The findings underscore that while water insecurity deepens inequality and poverty cycles, social innovation offers a transformative and scalable pathway toward equity, community empowerment, and the realization of the Sustainable Development Goals (SDG).

Keywords: water insecurity; Philippines; socioeconomic burdens; social enterprises; and Sustainable Development Goals

INTRODUCTION

Into the future, development requires not only strong economic growth but also inclusive and sustainable solutions that address fundamental human needs. Guided by the global commitment to the Sustainable Development Goals (SDG), one urgent challenge that demands attention is water insecurity. Access to clean and affordable water is central to human survival and

dignity, yet millions of people worldwide, and many Filipinos in particular, remain deprived of this resource (Ion Exchange, 2025). Globally, water scarcity has reached alarming levels. Nearly four billion people, two-thirds of the world's population, face severe shortages for at least one month each year. While over two billion live in countries with an inadequate supply (World Wildlife, n.d). If this is not fixed by 2025, half of



the global population may experience water scarcity, with around 700 million people at risk of displacement by 2030. By 2040, one in four children could grow up under extremely high water stress. These figures underscore that water insecurity is a global crisis with serious socioeconomic and environmental consequences (UNICEF, 2021). This highlights the need for transformative approaches to development. In this light, addressing water insecurity is not merely an infrastructure issue but also a matter of equity, health, education, and environmental sustainability.

In the Philippines, water insecurity remains a persistent challenge. Despite being Asia's fastest-growing economy, the country ranked only 33rd out of 48 in water security according to Lee et al. (2020), showing that economic progress does not always guarantee access to basic needs like water. Even Metro Manila, an

economically advanced region, has also suffered a severe water crisis in March 2019, leaving around six million people with intermittent or no supply and causing crop losses. Many households nationwide still lack access to safely managed drinking water. Yet most research has focused on agriculture or disaster relief, leaving the household-level and socioeconomic burdens of water insecurity underexplored.

Water insecurity goes beyond the absence of water. It encompasses the lack of safe, reliable, and affordable access to this essential resource. It reflects the everyday struggles of households and communities that face uncertainties in the availability and quality of water. Defining and understanding water insecurity is therefore important to unpacking its socioeconomic burdens and exploring how innovative and inclusive solutions can contribute to achieving the SDGs.



Significance of the Study

This study is significant as it addresses the urgent and timely issue of water insecurity and its socioeconomic implications in the Philippines. Despite economic growth and rapid urbanization, millions of Filipino households still face limited, unreliable, or unaffordable access to clean water. This challenge undermines not only public health but also educational attainment, household productivity, and long-term poverty reduction.

By examining the socioeconomic burdens of water insecurity, this research contributes valuable insights into how the lack of safe and affordable water deepens inequality across class, gender, and community settings. It also explores the potential of social entrepreneurship and social innovation to provide scalable and sustainable solutions that go beyond short-term aid, offering

community-driven and financially viable models that can address inequities in water access.

The study holds broader significance by highlighting the economic costs of water insecurity, including excessive household spending on vendors, increased out-of-pocket health expenditures from waterborne diseases, and reduced productivity due to illness or time spent collecting water. Lastly, it aligns with the global commitment to the SDG by supporting efforts to achieve SDG 6 (Clean Water and Sanitation), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action).

Statement of the Problem

Water insecurity remains a widespread challenge in the Philippines, where millions of households still lack access to safe, reliable, and affordable drinking water.



Despite infrastructure development, urban poor households continue to pay disproportionately higher costs for water through vendors or bottled sources, while rural communities remain dependent on unsafe wells and surface water. These inequities result in compounded burdens: greater exposure to waterborne diseases, higher financial strain, and disrupted education and livelihood outcomes.

Current scholarship has largely focused on agriculture, climate disasters, or broad water resource management, leaving the household-level socioeconomic impacts of water insecurity underexplored. At the same time, while community-led initiatives and social enterprises have emerged to address gaps in service delivery, there is limited evidence on their scalability and integration into long-term development policies.

Research Question and Objectives

The study addresses *how water insecurity creates economic and social burdens in the Philippines and in what ways can social entrepreneurship and innovation mitigate these challenges?*

Specifically, it aims to accomplish the following objectives: (1) to evaluate the socioeconomic impacts of water insecurity on Filipino households and communities, focusing on expenditure shares, health costs, and productivity losses; (2) to assess the unequal burdens of water insecurity across vulnerable and low-income groups, highlighting disparities in access and affordability; and (3) to explore the role of social entrepreneurship and social innovation in addressing water insecurity through scalable, inclusive, and sustainable models.

Scope and Limitations

This study focuses on examining the socioeconomic burdens of water



insecurity in the Philippines and the potential of social enterprises and social innovations as sustainable solutions. It evaluates household- and community-level impacts such as expenditure shares on water, out-of-pocket health costs from waterborne diseases, and productivity or educational losses linked to unsafe or unreliable access. The scope covers municipal- and provincial-level data to provide a nationwide picture while drawing from localized case studies such as WaterHope Inc., Manila Water's hybrid models, and community cooperatives, with international benchmarks like India's water ATMs and Kenya's kiosks for comparison. Methodologically, the study employs a mixed-methods approach, combining regression analysis of water insecurity indicators and health outcomes with qualitative reviews of secondary data and case studies. However, several limitations

frame the findings. The reliance on administrative health records and national surveys may entail data gaps or underreporting, while the statistical models establish associations rather than causation, since other factors, such as sanitation practices and governance, may not be fully captured. The study is also limited in geographic and temporal coverage, spanning only the most recent decade with consistent data, which may not account for short-term shocks like extreme weather events. Moreover, its focus remains on household- and community-level socioeconomic burdens, without delving into the broader political economy of water governance or large-scale hydrological dynamics. Finally, while social enterprise case studies highlight promising models, their scalability and sustainability are context-dependent and may not be generalizable across the nation. Despite these constraints,



the study contributes important insights into the unequal burdens of water insecurity. It highlights how social innovation can provide inclusive, community-driven, and sustainable pathways toward achieving water security.

Global Perspectives on Water Insecurity and Socio-economic Burdens

Water insecurity has emerged as a critical global concern, extending far beyond environmental scarcity into the realm of social and economic well-being. At the household level, inadequate access to safe and reliable water undermines health, livelihoods, and human capital formation. Stoler et al. (2021) emphasize that water insecurity, when compounded by climate change, often triggers migration decisions, both sudden displacements after disasters and gradual “slow-onset” mobility as

families seek stability elsewhere. In this sense, water insecurity is not simply a survival issue but also a driver of broader demographic and economic transformations.

The impacts are unevenly distributed, with low-income groups, women, and children bearing disproportionate burdens. Sorenson et al. (2011) show that women and girls often spend hours collecting water, reducing time available for education and productive work. This loss of opportunity translates into long-term reductions in household income and community development. Similarly, Brewis et al. (2020) found that water insecurity contributes to psychosocial stress, compounding existing health inequities.

On a macro scale, inadequate water governance threatens economic growth and political stability. Grey and Sadoff (2007) argue that unreliable water systems can constrain national



development by increasing health costs, disrupting productivity, and fueling social tensions. The U.S. National Intelligence Council (2021) projects that water scarcity and contamination will become central risks to global economic stability by 2040. Thus, from households to entire economies, water insecurity is now recognized as a multidimensional socioeconomic burden.

Water Insecurity in the Philippine Context

In the Philippines, these global challenges are particularly visible given the country's rapid urbanization, uneven development, and vulnerability to climate change. Despite progress in infrastructure, access to safe and affordable water remains deeply unequal. Alfonso (2022) demonstrates that urban poor households are systematically excluded from safely managed drinking water, even in areas

where infrastructure exists. This exclusion highlights how social and economic status continue to dictate access to essential resources. The "poverty penalty" identified by Mason (2014) magnifies the problem: households without piped connections pay up to 11 times more for water through vendors or bottled sources compared to wealthier households with direct connections. This dynamic forces poor families to allocate a higher share of already-limited income toward basic survival. UNICEF (2023) reports that more than half of Filipino households still lack access to safely managed drinking water, with rural and informal urban settlements bearing the greatest burden. Economic strain is further evidenced in willingness-to-pay studies. Preña and Labayo (2025) found that households in Legazpi City were willing to allocate nearly 2% of their monthly income for improved services, underscoring the intensity of



unmet demand. The Asian Development Bank (2024) further links water access inequality to stalled poverty reduction efforts, showing that inadequate water supply disproportionately affects education, health, and livelihood outcomes.

Socioeconomic Burdens of Water Insecurity

The socioeconomic consequences of water insecurity are multidimensional, affecting health, education, and poverty cycles. Research consistently shows that inadequate access to clean water and sanitation is both a cause and consequence of poverty. Celeste (2023) establishes a strong correlation between poverty levels and inadequate water access, emphasizing that poor households are more vulnerable to waterborne diseases and forced to rely on expensive, often unsafe alternatives. In the Philippines,

these risks are particularly acute. The Department of Health (2019) has documented recurring outbreaks of diarrhea and cholera linked to contaminated water sources, with the heaviest impacts falling on slum communities and rural barangays.

The effects of water insecurity extend beyond health to educational outcomes. UNESCO (2024) found that children, particularly girls, are disproportionately affected as they are often tasked with water collection or forced to miss school due to illness caused by unsafe water. Such disruptions reduce school attendance, weaken learning outcomes, and ultimately erode human capital formation. Over time, this perpetuates inequality by lowering lifetime earnings and limiting social mobility. At the global level, Zhou et al. (2017) provide evidence that water scarcity and poor access constrain socioeconomic development by reducing productivity



and placing heavy financial burdens on households and governments alike. The U.S. National Intelligence Council (2021) further warns that these cumulative vulnerabilities do not remain confined to households but can destabilize entire societies, posing risks to economic growth, social cohesion, and political stability.

Social Enterprises as a Solution Pathway

Conventional approaches to water provision in the Philippines, whether through government utilities or private companies, have often struggled to achieve universal coverage, particularly in poor and marginalized communities. Social enterprises (SEs) have emerged as innovative actors capable of bridging these service gaps by blending social missions with financially sustainable models. Unlike charity, which relies on donations, or purely private firms, which focus on

profit, SEs operate on hybrid logics that prioritize affordability, inclusivity, and community empowerment. Dacanay (2013) frames this through the concept of Social Enterprises with the Poor as Primary Stakeholders (SEPPS), where low-income communities are not passive beneficiaries but active co-owners or stakeholders in the enterprise. This approach redefines service delivery: instead of water access being determined by ability to pay or state subsidy, communities themselves play a role in governance and sustainability.

Several Philippine initiatives demonstrate the transformative role of SEs in the water sector. WaterHope Inc., a PepsiCo–NGO initiative, pioneered community water kiosks in urban poor settlements in Metro Manila, selling clean water at a fraction of vendor prices (ProsPER.Net, 2012). Beyond reducing household costs, the model created livelihood opportunities



for local residents employed in kiosk operations, aligning financial viability with community benefit. Similarly, cooperatives in Visayas and Mindanao mobilized community resources to establish self-managed water systems, which strengthened local governance and resilience (Ulep, 2024). At a larger scale, the World Bank–supported Manila Water project demonstrated the potential of hybrid collaborations. By combining public oversight, private sector expertise, and social development objectives, the project expanded piped access to more than 1.6 million low-income residents (World Bank, 2010). These cases illustrate that SEs can address inequities not only by lowering costs but also by empowering communities, fostering participation, and ensuring long-term sustainability. Thus, social enterprises provide a solution pathway that is both inclusive and scalable. By situating marginalized groups as

stakeholders, SEs transform water access from a commodity into a community-driven public good.

Scaling Social Innovation for Impact

While local pilots have proven effective, the central challenge is how to scale social enterprise models so that their impact extends beyond isolated communities to entire regions or even the nation. Scaling does not simply mean replication; it requires adapting business models, forging partnerships, and embedding SEs into broader development systems. The Asian Productivity Organization (2022) documents successful Philippine SEs like Alter Trade (focused on fair trade for sugar farmers) and Bote Central (coffee enterprise), which grew by combining community participation, inclusive market strategies, and value chain integration. Although not water-focused, these cases illustrate how SEs in the Philippines can



achieve both sustainability and expansion by embedding their models in local economies while accessing broader markets.

International cases provide further insights into scalable innovation in the water sector. In India, “water ATMs” dispense purified water at low cost, leveraging technology and micro-payments to ensure affordability and convenience (Schmidt, 2020). This model has expanded across multiple states, showing how small-scale interventions can achieve systemic reach. In Kenya, community water kiosks have proven both financially viable and socially inclusive, balancing cost recovery with equitable access (Nyika et al., 2025). These examples underscore the potential of technology, community ownership, and innovative financing to scale solutions.

For the Philippines, scaling water-focused SEs has particular relevance for the Sustainable

Development Goals (SDGs). Expanding access to affordable clean water directly advances SDG 6 (Clean Water and Sanitation). By reducing the disproportionate burden on poor households, SEs address SDG 10 (Reduced Inequalities). By embedding resilience into urban and rural systems, they contribute to SDG 11 (Sustainable Cities and Communities). Finally, by providing adaptive responses to water stress and climate shocks, they support SDG 13 (Climate Action). Unlike traditional aid or charity, SEs offer models that are financially sustainable, replicable, and responsive to community demand.

Research Gap

Despite promising advances in understanding water insecurity and piloting social enterprise solutions, significant gaps remain in both scholarship and practice. First, there is limited quantification of the



socioeconomic burdens of water insecurity in the Philippines. While existing studies highlight disparities in access, they often stop short of measuring the economic magnitude of these burdens, such as the share of household income spent on bottled or vended water, out-of-pocket health expenditures from waterborne illnesses, or productivity and educational losses tied to water-related disruptions. Without such data, the full cost of water insecurity, particularly for the poor and marginalized, remains underestimated, making it difficult to design evidence-based policy and targeted interventions.

Second, while there are notable case studies of social enterprises providing clean water services, few assess their long-term scalability, financial sustainability, or integration into policy frameworks. Much of the existing literature frames SEs as

temporary or localized responses to gaps in service provision. For instance, Chandra & Paras (2021) shows that SEs often emerge in the wake of crises, such as after Typhoon Haiyan, when grassroots organizations filled critical gaps in water and sanitation services. Yet, systematic evaluations of whether these enterprises can evolve into stable, scalable models embedded within national development strategies remain scarce.

This absence of rigorous long-term analysis creates a blind spot in both academic debates and policy-making. Without examining the durability and SDG-alignment of SE-led water solutions, governments risk underutilizing enterprises that could reduce inequities and enhance resilience. Addressing this gap is crucial to advancing not only theoretical understanding of social entrepreneurship in development but also its practical role in achieving SDG



6 (Clean Water & Sanitation), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities & Communities), and SDG 13 (Climate Action). By tackling these research gaps, this study positions itself to provide an original contribution: connecting quantified socioeconomic burdens of water insecurity with an evaluation of social enterprises as scalable, systemic solutions in the Philippine context.

METHODOLOGY

The study adopts a mixed-methods design that integrates qualitative and quantitative approaches to further understand the water insecurity in the Philippines, its socioeconomic and health consequences, and potential solutions through social entrepreneurship and social innovation.

The first strand is qualitative, focusing on defining water insecurity

and identifying its key dimensions, such as access to safe water, sanitation, affordability, and supply reliability. Drawing from secondary data from government agencies, institutional publications, and peer-reviewed literature. This will interpret how water insecurity shapes socioeconomic burdens by exacerbating inequality, imposing higher financial strain on low-income households, increasing exposure to health risks, and reducing educational and productivity outcomes. On the other hand, the second strand introduces a quantitative component that analyzes the correlation of water insecurity and health outcomes. Specifically, the incidence of major water-borne diseases, including Acute bloody diarrhea, cholera, leptospirosis, rotavirus, typhoid and paratyphoid fever, and viral hepatitis. This will be modeled using Ordinary Least Squares (OLS) regression, with



dependent variables expressed in their natural logarithmic form. Disease incidence is examined against selected indicators of water insecurity such as water use efficiency, water stress, levels of urbanization, population distribution, and population supplied by the water industry. This will allow the study to quantify correlations between water insecurity factors and health outcomes.

Lastly, the third strand will focus on a qualitative-descriptive approach, analyzing the role of social entrepreneurship and social innovation in addressing water insecurity. Case studies of WaterHope Inc., Manila Water's hybrid public-private initiative, and community cooperatives in Visayas and Mindanao are examined alongside international benchmarks such as India's water ATMs and Kenya's water kiosks. This strand synthesizes evidence on how social enterprises improve affordability,

accessibility, inclusivity, and sustainability, and evaluates their potential to provide scalable and community-driven solutions.

Data Description

The study used a mixed dataset that integrates national and subnational administrative health records, water access and supply indicators from government and utility sources, and socioeconomic and demographic information from the Philippine Statistics Authority (PSA) and other institutional databases. The health data are drawn primarily from the Department of Health, provided by the PSA, which shows records of disease incidence disaggregated by municipality or province, while water-related indicators include industry reports on coverage, population served, and piped water access. Complementary information on household consumption and



expenditure is obtained from national household surveys, which allow for the estimation of household water spending, and additional variables such as urbanization rates and water stress indices are incorporated to capture the broader environmental and demographic context. To enrich the quantitative analysis, case study material on social enterprises is drawn from published evaluations and grey literature, alongside academic assessments of water vending and kiosk models. The unit of analysis is set at the municipality level, with data aggregated on an annual basis. The study period spans the most recent ten years for which consistent data are available across health, water, and socioeconomic indicators, thereby allowing the analysis to capture medium-term associations while minimizing distortions from short-term fluctuations such as outbreaks or temporary disruptions.

Model Specification

To estimate the relationship between water insecurity and public outcomes, the study employs OLS regression models where the log of disease incidence serves as the dependent variable. Hence, the general functional form is:

$$\ln(\text{Disease}) = \alpha + \beta_1 LWS + \beta_2 WUE + \beta_3 PRL + \epsilon$$

Where:

- ln(Disease)* : The natural log of reported cases of a specific water-borne disease
- α : Intercept as the baseline log incidence of disease when all predictors are zero
- $\beta_1 LWS$: The level of water stress
- $\beta_2 WUE$: The water use efficiency (PhP per cubic meter of water)
- $\beta_3 PSWI$: The population supplied by the water industry
- ϵ : The error term, capturing unobserved factors

Each water-borne disease is modeled individually to highlight specific associations with water insecurity factors. The coefficients are interpreted in semi-elastic terms, wherein a unit change in independent variables corresponds to a proportional change in disease incidence. While the



quantitative results illustrate correlations rather than causal effects, they provide measurable evidence that complements the qualitative interpretation of socioeconomic burdens.

RESULTS AND DISCUSSION

Water insecurity is more than just the lack of water availability in an area. It refers to the condition where accessible, clean, and affordable access to sufficient water is not met by people in order to be used for cooking, drinking, sanitation, and livelihood (Jepson et al., 2017).

From a global perspective, the United Nations Water Organization asserts that approximately two billion people do not have access to clean water that is safe for drinking. This underscores the prevalence and severity of water insecurity around the world. On the other hand, zooming in on the Philippine context, nearly five

million Filipinos still rely on unsafe and unreliable water sources, while nine million individuals lack access to proper water and sanitation facilities. These figures reflect not just cases of water insecurity but the lack of initiatives and programs to improve access to clean and reliable water in the country.

The problem of water insecurity remains multidimensional; however, in the Philippines, studies still give limited attention to how reliability, intermittency, and quality shape everyday vulnerability. Thus, it must be assessed through experiential and structural indicators rather than access alone (Jepson et al., 2017). The results of this study show that Philippine monitoring frameworks continue to rely on coverage statistics that do not capture supply interruptions, contamination pathways, or affordability constraints. This gap affects policy design because



programs often prioritize infrastructure expansion without addressing operational weaknesses that undermine health and welfare outcomes. As Kim et al. (2015) note, countries with fragmented regulatory systems struggle to translate access into consistent service quality. These point to the need for analytical frameworks that evaluate water security through operational and institutional performance rather than simple access metrics. Incorporating indicators such as regulatory compliance, system resilience, and maintenance capacity would allow researchers and policymakers to examine the institutional dynamics that shape service quality.

Water Expenditures Drive Social Inequality

Furthermore, the issue of water insecurity around the world goes beyond the inability to meet basic

physiological needs. It also carries significant socioeconomic implications. For instance, a paper conducted by Webb and Iskandarani (1998) pointed out that when it comes to water expenses and pricing, the poverty-stricken households typically pay high prices for water accessibility, and they remain classified as water insecure due to the relatively high water cost. Moreover, the study goes on by looking at the income share of water expenditure for these households. The paper presented that slum dwellers may spend as much as 30% of their income on water, whereas wealthier urban households spend only about 2%. More than these figures, the paper noted that the willingness to pay for access to clean water for these poor households is high. The paper cited that poor rural and urban residents in countries like Mozambique, India, Ghana, and Ethiopia are willing to pay more for



safe and reliably delivered water near their homes or farms. These findings are alarming, as they reveal how water insecurity and high water expenses exacerbate social inequality. This argument is then supported by Truelove (2019), who mentioned that water access and security are usually shaped by the co-constitution of social and natural factors (socio-natural processes). This paper looks at water insecurity as a social determinant because it claims that the exclusion of urban poor and other groups from equitable and reliable water access is not simply due to overpopulation, declining water tables, or "naturally" produced scarcity but is concurrently socially and politically manufactured. This means that power relations combine with material and ecological factors to shape the unequal flow and regulation of water in cities.

Hall et al. (2015) documented that Manila's urban poor households pay

several times more per unit of water than households connected to utilities because regulatory institutions do not effectively manage vendor pricing or enforce equitable service obligations. This pricing pattern persists in areas where utilities have not extended distribution networks, which forces households to rely on costlier alternatives regardless of income constraints. These outcomes give emphasis on how affordability problems originate not only from supply limitations but also from regulatory gaps that allow informal markets to dominate service provision. In many low-income contexts, pro-poor water governance identifies affordability as a foundational component of water security (Bakker, 2003). The findings show that households in underserved areas continue to rely on high-cost alternatives due to utilities and local governments have not expanded piped



distribution networks at a pace commensurate with population growth. Strengthening tariff regulation, extending service coverage mandates, and institutionalizing hybrid delivery models such as community-based enterprises are potential policy measures that directly address these inequities and are aligned with international recommendations for inclusive water governance.

Water Insecurity and its Effects on Education and Economic Productivity

Water insecurity not only affects socioeconomic status because of its costs, which can contribute to social inequality. It also affects other economic factors such as education and productivity. A study conducted by Rhue et al. (2019) argues that water insecurity significantly impacts education, primarily by contributing to increased school absenteeism and

affecting children's overall well-being and opportunities. The study points out that inadequate Water, Sanitation, and Hygiene (WASH) at both household and community levels impact children's well-being and is a factor in increasing absenteeism. Particularly, the paper stated that girls aged 11 and older are especially affected, experiencing a higher likelihood of school absence compared to boys of the same age and younger girls. This is largely due to menstrual hygiene challenges when schools lack adequate, clean and reliable water access, leading to decreased attendance and increased drop-out rates. The impact of such water insecurity continues to shape educational attainment and future employment opportunities. Water insecurity may impact the economy in the short run because of absenteeism, but it can also affect productivity in the long run if it continues to persist. Rosinger and Young (2020) present



that water is imperative for economic productivity, along with nutrition, health, and political stability. The paper also argues that there is growing evidence in academic journals that water problems, specifically water insecurity, stifle economic productivity.

Research in low and middle-income countries demonstrates that inadequate water supply and poor WASH conditions significantly reduce school attendance and diminish long-term human capital outcomes. Sharma et al. (2022) show that children in water-insecure households experience higher absenteeism and lower academic performance because of illness, caregiving demands within the household, or the need to collect water. Philippine policy frameworks acknowledge WASH as a health concern but do not systematically integrate water access into educational planning or labor productivity assessments. The absence of

coordinated school-based WASH programs and the limited integration of water security into human development policies represent a major gap. The findings of this study reinforce international evidence by showing that water insecurity restricts both present and future economic opportunities. Strengthening WASH investments in schools and embedding water security in local development plans can mitigate these long-term socioeconomic losses.

Health Results

In the case of acute bloody diarrhea, the result of the regression shows a significant intercept, suggesting a baseline presence independent of predictors. The variable population supplied by the water industry and water use efficiency also show marginal significance. The results suggest that diarrheal diseases are reduced because access to treated



water lowers exposure to fecal contamination. However, efficiency may sometimes be linked to rationing and intermittent supply, which increases reliance on unsafe water storage and secondary contamination.

Journals also present that diarrhea is one of the most sensitive indicators of poor water access, accounting for over 480,000 child deaths globally each year (Husein et al., 2023).

Variable	Acute Bloody Diarrhea	Cholera	Leptospirosis	Rotavirus	Typhoid and Paratyphoid	Viral Hepatitis
	Significance	Significance	Significance	Significance	Significance	Significance
Intercept	18.253** (6.885)	10.1261 (13.192)	-3.489 (3.253)	6.808 (5.400)	9.009 (4.685)	11.9987* (5.669)
Water Stress	-11.4238 (30.75)	-58.295 (58.926)	35.206* (14.531)	11.309 (24.120)	36.177 (20.930)	-12.613 (25.322)
Levels of Water Use Efficiency	0.0596* (0.0286)	-0.033 (0.054)	0.0127 (0.013)	0.022 (0.022)	0.019 (0.0194)	-0.007 (0.0235)
Population Supplied by Water Industry	-0.807* (.373)	0.828 (0.715)	-0.027 (0.176)	-0.298 (0.292)	-0.688** (0.254)	0.004** (0.3074)

*p<0.10, **p<0.05, ***p<0.01

For cholera, the results show that there are no significant predictors at the 90%, 95%, and 99% confidence intervals. Cholera outbreaks are highly sensitive to acute contamination events such as floods, sewage intrusion, and natural disasters rather than long-term water efficiency or stress levels. This could explain why the model did not capture significance.

With respect to leptospirosis, the level of water stress variable is the only predictor that shows marginal significance and is positively associated with Leptospirosis cases. Irregular water availability often forces communities to use unsafe sources such as floodwater or irrigation canals. Leptospira bacteria thrive in stagnant water, especially during rainy seasons when flooding occurs in already



stressed systems (Wynwood et al., 2014). In the case of the Philippines, cases of Leptospirosis peak after typhoons, and this links directly to water stress and poor flood control.

As for rotavirus, the result of the regression presents no significant predictors. Rotavirus is often spread within households and among children through poor hygiene rather than large-scale water system factors. Vaccination has also reduced severe cases in recent years, weakening the direct link with water supply.

Turning to typhoid and paratyphoid, the results show that the population supplied by the water industry variable is significantly negative at the 95% confidence level. A reason for this is that broader piped water coverage reduces reliance on unsafe wells, rivers, and vendors, lowering *Salmonella typhi/paratyphi* exposure (Mogasale et al., 2018). A meta-analysis finds that improved

water access lowers typhoid risk by ~70% (Kim et al., 2023).

Lastly, for viral hepatitis, results of the regression present that the intercept is marginally significant and that the population supplied by the water industry is significantly positive. This counterintuitive result suggests that while coverage increases, water quality may be compromised; intermittent supply, poor chlorination, or old pipes may allow contamination such as fecal matter, introducing the Hepatitis A virus.

Across all outcomes, the regression results show that water-related factors affect diseases differently. Piped water access lowers diarrhea and typhoid, while water stress increases leptospirosis. Cholera and rotavirus are more linked to acute events and household hygiene.

However, viral hepatitis rises with wider coverage, likely due to poor water quality and infrastructure issues.



Mitigating Water Insecurity through Social Enterprise and Innovation

Efforts to mitigate the socioeconomic and health impacts of water insecurity have been strengthened by social entrepreneurship and social innovation. International evidence demonstrates that access to an improved water supply can transform household welfare. In many low and middle-income countries, interventions that improve water delivery reduce the time spent collecting water by an average of eight hours per week, freeing time for education, income generation, or rest (Bisung & Elliott, 2018). Similarly, community kiosks and automated water dispensing systems have proven capable of lowering costs and ensuring water quality. For instance, in Rwanda, according to Hutteringer et al. (2017), the community kiosks produce treated water at approximately 1 *USD/m³* and sell it,

1.50–3.50 *USD/m³* yielding sustainable profit margins at around 25%. In Malawi, the transition from manual to automated kiosks resulted in a 65% reduction in household water costs (World Bank, 2020). At a broader scale, the World Health Organization estimates that every 1 *USD* investment in water, sanitation, and hygiene yields a return of 5–46 *USD*, largely due to time savings and productivity gains (Hutton et. al., 2004). These only illustrate the magnitude of socioeconomic relief that social innovation can achieve when effectively implemented.

In the Philippine context, the persistence of water insecurity underscores the need for such innovative solutions. The Philippine Statistics Authority reported in 2024 that 97.5% of families had access to at least basic drinking water service, but only 53.1% benefited from safely managed drinking water that is reliable



and of assured quality. Furthermore, only 44.4% of families experienced water collection times of less than 30 minutes, meaning that a majority continue to incur significant time costs in accessing water. These burdens are compounded by inequality in urban households, particularly in Metro Manila, where families pay a median of 500PHP per month for water, while families in Mindanao pay about 300PHP monthly (Cervantes, 2023). For many low-income households, this expenditure represents a sizable share of their limited income. The consequences extend to health outcomes. The Philippine Institute for Development (PIDS), in collaboration with UNICEF, highlighted that poor water, sanitation, and hygiene (WASH) practices contributed to 86% of diarrhea-related deaths in 2019, most of which occurred among children under five (PIDS, 2024).

Social enterprises and community innovations offer a pathway to mitigate these burdens. The proliferation of water refilling stations across the Philippines exemplifies localized, affordable delivery models. These stations typically charge 25–40 *PHP* for a five-gallon container, and although initial investments range from 200,000 – 500,000 *PHP*, they become financially viable through consistent community demand (Business Diary PH, 2023). By situating such enterprises within underserved areas, they reduce household reliance on expensive vendors and minimize the time spent traveling to distant water sources. The benefits are not purely economic. By ensuring a safer and more reliable supply of water, such enterprises can directly lower exposure to waterborne pathogens, thereby reducing disease incidence. This is relevant in poorer municipalities, where reliance on



unsafe sources such as surface water remains prevalent and diarrheal illness continues to be one of the leading causes of hospitalization.

Beyond refilling stations, hybrid financing models and cooperative governance represent innovative approaches that enhance both sustainability and inclusivity. By combining revenue streams from higher-income customers and subsidies or grants targeted at low-income households, social enterprises can maintain affordability while ensuring financing sustainability. Cooperative management, where communities co-own and oversee water systems, strengthens local accountability and promotes resilience. This governance structure also generates local employment opportunities and reduces the risk of system neglect or mismanagement (Jepson et al., 2017). Integrating these entrepreneurial efforts with public

health campaigns further enhances their impact by simultaneously addressing behavioral and environmental determinants of waterborne diseases.

The evidence across the globe and local data underscores the transformative potential of social innovation in the water sector. Expanding access to safely managed water services and reducing both time and monetary burdens can substantially improve household welfare. Lowering costs, saving time, and reducing disease risks, social enterprises and social innovations do not merely fill gaps left by formal utilities but actively create pathways for inclusive economic growth and public health improvement. In this way, the transformation of water insecurity from a persistent socioeconomic and health burden into an opportunity for community empowerment and sustainable development.



CONCLUSION

The study reveals that water insecurity in the Philippines is not only about the scarcity of water but also about the significant socioeconomic burdens it imposes. The results reveal that poor households spend a much larger share of their income on costly water alternatives, which increases inequality and traps families in poverty. Beyond financial strain, water insecurity disrupts education and limits productivity, reducing opportunities for long-term growth. Health outcomes also highlight its impact. Access to piped water helps reduce diarrheal and typhoid cases, but water stress increases leptospirosis, and weaknesses in infrastructure, such as old pipes and intermittent supply, contribute to viral hepatitis. These findings confirm that water insecurity is shaped by social and political conditions as much as by natural scarcity.

The study also finds that social entrepreneurship and community innovation can help address these challenges. Local initiatives such as water refilling stations, cooperatives, and kiosks show that clean and affordable water can be delivered while also creating jobs and strengthening community ownership. Evidence from international cases further shows that investments in water access bring significant social and economic returns.

In answering the research question, the study concludes that water insecurity in the Philippines creates unequal economic, social, and health burdens. However, social enterprises offer a practical and sustainable way to reduce these burdens. By filling gaps left by government and private providers, they improve household welfare, build resilience, and promote inclusive development.



To address the socioeconomic and health burdens of water insecurity in the Philippines, several actions are recommended. First, strengthening water quality monitoring and regulatory enforcement is essential, particularly for water-refilling stations and small-scale providers, to ensure compliance with safety standards and prevent contamination risks. Next, improving the reliability and maintenance of existing water infrastructure, such as repairing leaks, rehabilitating aging pipelines, and ensuring consistent treatment, must be prioritized rather than focusing solely on expanding coverage because this directly improves service continuity and safety. To reduce the financial strain on vulnerable households, targeted subsidy schemes such as water vouchers, tiered pricing, or discounts should be implemented to address the poverty penalty and make clean water more affordable.

Moreover, supporting and scaling social enterprise water models through financing, LGU partnerships, and technical capacity building can expand affordable, community-managed solutions in underserved areas. Beyond these measures, institutionalizing the proposed Water Superbody or Department of Water Resources is necessary to unify fragmented governance, strengthen accountability, and streamline regulatory functions across agencies. Finally, operationalizing the Water Resources Management Office (2023) as a transitional coordination mechanism can enhance inter-agency alignment, improve monitoring, and support integrated water resource planning as long-term reforms progress.

REFERENCES

Alfonso, S. M., Kazama, S., & Takizawa, S. (2022). Inequalities in



- access to and consumption of safely managed water due to socio-economic factors: Evidence from Quezon City, Philippines. *Current Research in Environmental Sustainability*, 4, Article 100117.
- Asian Development Bank. (2024). *Asian development outlook 2024: Key indicators for Asia and the Pacific*. <https://www.adb.org/publications>
- Bakker, K. J. (2003). From public to private to... mutual? Restructuring water supply governance in England and Wales. *Geoforum*, 34 (3), 359-374.
- Bisung, E. & Elliott, S. J. (2018). Improvement in access to safe water, household water insecurity, and time savings: A cross-sectional retrospective study in Kenya. *Social Science & Medicine*, 200, 1-8.
- Brewis, A., Choudhary, N., & Wutich, A. (2020). Household water insecurity may influence common mental disorders directly and indirectly through multiple pathways. *Social Science & Medicine*, 245, Article 112746.
- Business Diary. (2025). *Updated guide: How to start a water refilling station business*. <https://businessdiary.com.ph/830/how-to-start-a-water-refilling-station-business/>
- Celeste, M. (2023). Linking poverty with water and sanitation in developing countries. *Journal of Water, Sanitation and Hygiene for Development*, 13(2), 140–151.
- Cervantes, F. M. (2023). *More than half of Filipinos have access to piped water: SWS*. Philippine News Agency.
- Chandra, Y., & Paras, A. (2021). Social entrepreneurship in the context of disaster recovery: Organizing for public value creation. *Public*

- 
- Management Review*, 23(12), 1856–1877.
- Dacanay, M. L. (2013). *Social enterprises with the poor as primary stakeholders: Responding to state and market failures in the south*.
https://emes.net/content/uploads/publications/Dacanay_ECSP-LG13-67.pdf
- Dacanay, M. L. M. (2022). *Social entrepreneurship and productivity*. Asian Productivity Organization.
- Department of Health. (2019). *Waterborne diseases in the Philippines: Epidemiological report*.
- Grey, D., & Sadoff, C. W. (2007). Sink or swim? Water security for growth and development. *Water Policy*, 9(6), 545–571.
- Hall, R. A., Lizada, J.C., Dayo, M.H., Corazon, A., David, M., & Rola, A.C. (2015). To the last drop: The political economy of Philippine water policy. *Water Policy*, 17, 946-962.
- Husein, M., Nounkeu, C. D., Armah, S., & Dharod, J. M. (2023). Examination of water quality at the household level and its association with diarrhea among young children in Ghana: Results from UNICEF-MICS6 survey. *PLOS Water*, 2(6), Article e0000049.
- Huttinger, A., Brunson, L., Moe, C. L., Roha, K., Ngirimpuhwe, P., Mfura, L., Kayigamba, F., Ciza, P., & Dreibelbis, R. (2017). Small water enterprise in rural Rwanda: Business development and year-one performance evaluation of nine water kiosks at health care facilities. *International Journal of Environmental Research and Public Health*, 14(12), Article 1584.
- Hutton, G., Haller, L., & World Health Organization. (2004). *Evaluation of the costs and benefits of water and sanitation improvements at the*



- global level.* World Health Organization.
- Ion Exchange. (2025, July 21). *The global water crisis: Causes, facts, and solutions.* <https://ionexchangeglobal.com/the-global-water-crisis-causes-facts-and-solutions/>
- Jepson, W. E., Wutich, A., Collins, S. M., Boateng, G. O., & Young, S. L. (2017). Progress in household water insecurity metrics: a cross-disciplinary approach. *Wiley Interdisciplinary Reviews: Water*, 4(3), Article e1214.
- Kim, C., Goucher, G. R., Tadesse, B. T., Lee, W., Abbas, K., & Kim, J. H. (2023). Associations of water, sanitation, and hygiene with typhoid fever in case-control studies: a systematic review and meta-analysis. *BMC Infectious Diseases*, 23(1), Article 562.
- Kim, J. H., Keane, T. D., & Bernard, E. A. (2015). Fragmented local governance and water resource management outcomes. *Journal of Environmental Management*, 150, 378-386.
- Lee, H., Son, J., Joo, D., Ha, J., Yun, S., Lim, C.-H., & Lee, W.-K. (2020). Sustainable water security based on the SDG framework: A case study of the 2019 Metro Manila water crisis. *Sustainability*, 12(17).
- Mason, N., & Calow, R. (2014). *The real water crisis: Inequality in a fast changing world.* Overseas Development Institute.
- Mogasale, V. V., Ramani, E., Mogasale, V., Park, J. Y., & Wierzba, T. F. (2018). Estimating typhoid fever risk associated with lack of access to safe water: A systematic literature review. *Journal of Environmental and Public Health*, 2018(1), Article 9589208.
- Nyika, J., & Dinka, M. O. (2025). Water kiosks in alleviating water shortage



among urban poor in Africa: A review. *Water Conservation and Management*, 9(2), 335–338.

Philippine Institute for Development Studies. (2024). *Persistent diarrhea cases in PH highlight gaps in clean water access, PIDS study reveals*. <https://www.pids.gov.ph/details/newspress-releases/persistent-diarrhea-cases-in-ph-highlights-gaps-in-clean-water-access-pids-study-reveals>

Philippine Statistics Authority (2025). *Access to basic drinking water service among families improved in 2024*. <https://psa.gov.ph/content/access-basic-drinking-water-service-among-families-improved-2024>

Preña, J. A., & Labayo, H. (2025). *Understanding household willingness to pay for enhanced water services: Evidence from the Philippines*.

<https://doi.org/10.1007/s40899-025-01279-4>

Rhue, S. J., Torrico, G., Amuzie, C., Collins, S. M., Lemaitre, A., Workman, C. L., Rosinger, A. Y., Pearson, A. L., Piperata, B. A., Wutich, A., Brewis, A., & Stoler, J. (2023). The effects of household water insecurity on child health and well-being. *WIREs Water*, 10(6), Article e1666.

Rosinger, A. Y., & Young, S. L. (2020). The toll of household water insecurity on health and human biology: Current understandings and future directions. *WIREs Water*, 7(6), Article e1468.

Schmidt, J. J. (2020). Water ATMs and new delivery networks in India. *Water Alternatives*, 13(1), 156–172.

Sharma, M. K., Khanal, S. P., & Adhikari, R. (2022). School water, sanitation, and hygiene: A systematic review of an effect on health, attendance, regularity, and



- educational achievements. *Scholars' Journal*, 5, 1-21.
- Sorenson, S. B., Morssink, C., & Campos, P. A. (2011). Safe access to safe water: The importance of gender, class, and context. *Social Science & Medicine*, 72(9), 1522–1526.
- Stoler, J., Brewis, A., Kangmennang, J., Keough, S.B., Pearson, A. L., Rosinger, A. Y. Stauber, C., & Stevenson, E. G. J. (2021). Connecting the dots between climate change, household water insecurity, and migration. *Current Opinion in Environmental Sustainability*, 51, 36–41.
- Truelove, Y. (2019). Rethinking water insecurity, inequality and infrastructure through an embodied urban political ecology. *WIREs Water*, 6, Article e1342.
- U.S. National Intelligence Council. (2021). *The future of water: Risks to global growth, health, and stability*. <https://www.dni.gov/index.php/gt2040-home/gt2040-deeper-looks/future-of-water>
- Ulep, V. G., Talamayan, J. T., Casas, L. D., Villaseñor, J. M., & Bacatan, E. (2024). *The last-mile challenge: Water, sanitation, and hygiene (WASH) in the Philippines* (PIDS Discussion Paper Series No. 2024-19). Philippine Institute for Development Studies.
- UNESCO World Water Assessment Programme. (2024). *Water and gender*. UNESCO. <https://www.unesco.org/en/wwap/gender>
- United Nations Children's Fund (UNICEF). (2021). *Water scarcity*. <https://www.unicef.org/wash/water-scarcity>
- UNICEF. (2023). *Water, sanitation and hygiene in the Philippines*. <https://www.unicef.org/philippines/water-sanitation-and-hygiene>



UN Water. (n.d.). *Water, food and energy.*

<https://www.unwater.org/water-facts/water-food-and-energy>

WaterHope Inc. (n.d.). *WaterHope water-stations in Metro Manila: Building sustainable livelihoods.*

UNU-IAS ProsperNet.
<https://prospernet.ias.unu.edu/wp-content/uploads/2012/09/WaterHope-Case-Study-AIT-case-1.pdf>

Webb, P., & Iskandarani, M. (1998).

Water insecurity and the poor: Issues and research needs. ZEF–Discussion Papers on Development Policy, 2.
<https://doi.org/10.22004/ag.econ.279785>

World Bank. (2010). *Philippines: Water for the poor.*

<https://www.worldbank.org/en/news/feature/2010/07/04/philippines-water-poor>

World Bank. (2020). *Automated water kiosks provide continuous water for*

Malawians during COVID-19.

<https://www.worldbank.org/en/news/feature/2020/09/09/automated-water-kiosks-provide-continuous-water-for-malawians-during-covid-19#:~:text=In%20response%20to%20community%20concerns,to%20water%20at%20any%20time>

World Wildlife Fund. (n.d.). *Water scarcity.*

<https://www.worldwildlife.org/threats/water-scarcity>

Wynwood, S. J., Graham, G. C., Weier, S. L., Collet, T. A., McKay, D. B., & Craig, S. B. (2014). *Leptospirosis from water sources. Pathogens and Global Health, 108(7), 334-338.*

Zhou, Q., Deng, X., & Wu, F. (2017). *Impacts of water scarcity on socio-economic development: A case study of Gaotai County, China. Physics and Chemistry of the Earth, 101, 204–213.*



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***Wastewater-based epidemiology in the Philippines: Current
status, challenges, and future directions for public health
surveillance***

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ABSTRACT

Wastewater-based epidemiology (WBE) is an approach to characterize community-level and environmental health by detecting biological and chemical markers in wastewater. It holds considerable potential in the Philippines as a complementary tool to clinical surveillance for disease detection and monitoring. This review synthesized current knowledge on WBE in the Philippines, based on peer-reviewed literature identified through Google Scholar, PubMed, SCOPUS, and the Web of Science. Fourteen relevant studies were analyzed, revealing a wide diversity of microbial contaminants—including *Blastocystis*, *Escherichia coli*, *Enterobacteriaceae*, *Leptospira*, enteroviruses, hepatitis viruses, rotaviruses, and severe acute respiratory syndrome coronavirus 2—persisting in Philippine wastewater. WBE is aligned with several Sustainable Development Goals (SDGs), particularly those related to health, sanitation, innovation, sustainable cities, responsible consumption, and partnerships. However, several technological, institutional, contextual, and financial barriers hinder its national-scale implementation. Addressing these obstacles through pilot projects, collaborative partnerships, and phased integration into national health and environmental policies will be relevant to establishing and implementing WBE as a sustainable pillar of public health surveillance and environmental management in the Philippines.

Keywords: contaminants; environmental surveillance; public health; sustainable development goals; and wastewater

INTRODUCTION

Wastewater encompasses water discharged from various domestic, industrial, and agricultural activities, containing a complex mix of physical, chemical, and microbiological components (Das et al., 2022). Despite being predominantly water (99.9%), it carries approximately 0.1%

solid impurities, including organic matter and heavy metals, which render it unsuitable for direct disposal or reuse (Gitter et al., 2023). Unfortunately, there are various sources of wastewater contamination, including septic tank discharges, surface runoff from rainfall and groundwater, domestic sewage, and



industrial and agricultural effluents, presenting significant challenges for treatment, particularly in countries with inadequate sewage infrastructures like the Philippines. In the Philippines, the limited infrastructures for wastewater management lead to the discharge of untreated wastewater to water sources, resulting in contamination (Aguilar et al., 2014). This scenario presents significant risks, such as the country's emergence and spread of waterborne diseases. Furthermore, the widespread wastewater contamination generally contributes to global environmental degradation and public health risks (Amarille et al., 2021; Mahmood et al., 2022; Sepúlveda-Muñoz et al., 2023).

Only 10% of wastewater in the Philippines undergoes treatment, and only 5% of the total population has access to centralized sewage systems, which forces many to rely on less hygienic alternatives such as open

defecation and pit latrines. Regardless of the existing sewage and septage treatment facilities in Metro Manila, those facilities only cater to a small fraction of the city's inhabitants, highlighting the significant gap in inadequate service coverage. Handling industrial wastewater also presents an additional challenge, as there is limited data on compliance with effluent standards among businesses in special economic zones. High costs associated with existing technologies further enhance the sanitation crisis, particularly affecting marginalized communities, emphasizing the urgent need for sustainable solutions and governmental support. Addressing these challenges requires not only improving wastewater management infrastructure but also collaborative efforts to promote increased awareness and behavioral change and prioritize sanitation as a public health imperative (Jalilov, 2017; ARCOWA,



2018; Tuddao, 2021; Robredo et al., 2022).

This paper determined the existing microbial contaminants in Philippine wastewater; discussed the role of wastewater-based epidemiology (WBE) in advancing aligned sustainable development goals; identified the challenges affecting the implementation of a national WBE system in the country; and described the future directions for strengthening WBE in the Philippines.

METHODOLOGY

This study employed a narrative review approach to synthesize current knowledge on WBE in the Philippines. Literature searches were conducted in Google Scholar, PubMed, Scopus, and Web of Science to identify peer-reviewed publications relevant to WBE and wastewater microbial contaminants. Search strategies combined keywords and Boolean

operators, including ('wastewater-based epidemiology' OR 'WBE' OR 'microbial contaminants') AND ('Philippines') AND (bacteria OR parasites OR viruses). Inclusion criteria were peer-reviewed studies published in English that investigated microbial contaminants in wastewater within the Philippine context. Exclusion criteria were studies conducted outside the Philippines, non-English publications, and non-peer-reviewed sources. Given the limited availability of literature, all eligible studies were included regardless of publication year. For each study, data extracted included author(s), year of publication, study location, methodologies performed, and target microorganisms. Extracted information was organized and synthesized qualitatively.



RESULTS AND DISCUSSION

Microbial contaminants in Philippine wastewater

Fourteen ($n=14$) English peer-reviewed wastewater microbial studies in the Philippines have been identified in this study. These studies were conducted in the Philippines but varied in sampling locations, durations, frequencies, and target microorganisms.

Wastewater microbial studies in the Philippines reported the presence of pathogens, namely, antibiotic-resistant *Enterobacteriaceae* (Tolenada & Dayrit, 2022), carbapenemase-producing *Enterobacteriaceae* (Suzuki et al., 2020), *Escherichia coli* (Paraoan et al., 2017), *Leptospira* (Saito et al., 2013; Mendoza & Rivera, 2019), *Blastocystis* (Banaticla & Rivera, 2011), enteroviruses (Apostol et al., 2012; Shrestha et al., 2024), hepatitis A and

E viruses (Raya et al., 2024), lytic bacteriophages (Nada et al., 2023), rotaviruses (Imagawa et al., 2020), and SARS-CoV-2 (Otero et al., 2022; Apostol et al., 2023; Inson et al., 2024). These studies highlight the role of wastewater as a diagnostic environmental sample to identify existing pathogens circulating in specific communities in the Philippines and to assess human health status in some local regions.

The collection of wastewater samples in the Philippines has been mainly conducted in the National Capital Region (NCR), specifically in Metro Manila (Las Pinas, Mandaluyong, Makati City, Manila, Paranaque City, Pasay City, Pasig City, Quezon City, and Taguig City) and Bulacan (Bocaue, Marilao, and Meycauayan). Some published studies had collected wastewater samples from other regions and provinces, such as the Cordillera Administrative Region



(Benguet), Region II- Central Luzon (Nueva Ecija and Pampanga), Region IV-A CALABARZON (Rizal and Cavite), Region VI- Western Visayas Region (Aklan), Region VIII- Eastern Visayas Region (Biliran and Leyte), Region XI (Davao City), and Region XII SOCCSKSARGEN (South Cotabato). Notably, most wastewater microbial studies in the Philippines focused mainly on urban areas especially in Luzon Island.

The number of samples and volume of wastewater samples varied among the published studies. Apostol et al. (2023) collected the highest number of samples ($n = 250$) while Tolenada and Dayrit (2022) and Nada et al. (2023) failed to mention in their papers the total number of samples collected. Based on the volume of wastewater samples collected, the least was 10 ml by Saito et al. (2013) and Mendoza and Rivera (2019). On the other hand, the largest volume of

samples obtained was 2L by Apostol et al. (2012). The differences in the number and volume of samples collected in these studies can be associated with the type of microorganisms being detected in each study and the availability of human resources to conduct the sampling.

In terms of sampling frequency, published studies typically did a once or twice a month sampling of wastewater (Banaticla & Rivera, 2011; Apostol et al., 2012; Imagawa et al., 2020; Otero et al., 2020; Inson et al., 2024). In contrast, some of the studies failed to specify the sampling frequency (Saito et al., 2013; Paraoan et al., 2017; Mendoza & Rivera, 2019; Suzuki et al., 2020; Tolenada & Dayrit, 2022; Apostol et al., 2023; Nada et al., 2023). In terms of sampling duration, the shortest sampling duration was one month by Mendoza & Rivera (2019) and Otero et al. (2022). On the



other hand, the longest sampling duration was 25 months by Suzuki et al. (2020). Sampling frequency can be influenced by several factors, such as sampling permission from facilities, materials, and human resources availability, as well as unexpected changes in weather conditions (i.e., typhoons, flooding, etc.).

Several of the published studies performed concentration methods for wastewater, such as centrifugation (Banaticla & Rivera, 2011; Saito et al., 2013; Inson et al., 2024; Raya et al., 2024; Shrestha et al., 2024), membrane filtration method (Paraoan et al., 2017; Nada et al., 2023), polyethylene glycol (PEG) precipitation (Apostol et al., 2012; Imagawa et al., 2020; Otero et al., 2022), and two-phase concentration technique (Apostol et al., 2023). The concentration methods primarily depend on the microbial targets and

the availability of resources in specific settings.

These wastewater microbial studies in the Philippines underscore the importance of wastewater in evaluating the health status of local communities. In addition, these studies emphasize the importance of identifying and addressing existing gaps in wastewater treatment issues nationwide. Overall, the diversity of microbial contaminants in Philippine wastewater underscores the significance of practical and systematic monitoring approaches to address these wastewater contaminants in the country.

Wastewater-Based Epidemiology and its role in advancing the Sustainable Development Goals (SDG)

Wastewater-based epidemiology, also referred to as wastewater fingerprinting or sewage epidemiology,



is an emerging approach that assesses community health by analyzing biological and chemical markers in wastewater. These biomarkers include pathogens, drug residues, food toxicants, and endogenous chemicals linked to illness, providing insights into disease circulation, chemical exposures, and lifestyle patterns. The principle of WBE revolves around extracting, detecting, and evaluating these entities from samples collected at wastewater treatment plants and environmental water sources within urban catchments (Senta et al., 2020; Sims & Kasprzyk-Hordern, 2020; O’Keeffe, 2021; Sridhar et al., 2022).

WBE studies contribute to several Sustainable Development Goals (SDGs). By complementing clinical surveillance and monitoring disease prevalence, it advances SDG 3: Good Health and Well-being. Through its role in assessing water quality and

sanitation infrastructure, WBE supports SDG 6: Clean Water and Sanitation. As an innovative surveillance tool, it aligns with SDG 9: Industry, Innovation, and Infrastructure, while providing evidence for urban planning and environmental health, thereby contributing to SDG 11: Sustainable Cities and Communities. By promoting sustainable effluent management and reducing pollution, WBE reinforces SDG 12: Responsible Consumption and Production. Finally, WBE fosters collaboration and capacity-building initiatives, consistent with SDG 17: Partnerships for the Goals. Despite the strong alignment of WBE with these SDGs, its practical implementation in the Philippines remains constrained by technical, institutional, contextual barriers, and financial barriers which must be addressed first to benefit from its full potential as a public health surveillance tool.



Challenges in WBE implementation in the Philippines

WBE presents both promising avenues and substantial obstacles within the public health framework of the Philippines. Yet, its effective implementation faces several challenges that must be addressed. Technical challenges include the lack of standardized methodologies, which hampers the creation of a unified national wastewater surveillance system, and inconsistency in temporal data due to variation in sampling duration, which complicates the establishment of long-term trends and real-time surveillance. Institutional challenges arise from resource limitations that hinder consistent and long-term monitoring efforts, as well as bureaucratic and logistical hurdles in accessing sampling sites, which can reduce sampling frequency and coverage. Contextual challenges reflect the Philippine setting: most

studies have focused on highly urbanized areas in Luzon, leaving rural communities underrepresented, and the microbial contaminants detected in urban wastewater may not accurately reflect those in more remote regions. Moreover, the country's vulnerability to heavy rainfall and flooding during the rainy season can interrupt sampling schedules and dilute wastewater samples, thereby affecting detection accuracy. Beyond technical, institutional, and contextual challenges, financial considerations should also be considered. While WBE offers clear economic advantages—such as cost-effective population-level surveillance, reduced reliance on individual diagnostic testing, and early outbreak detection that can lower healthcare expenditures—the initial investment required to build laboratory infrastructures, train personnel, and standardized protocols is substantial. Furthermore, sustained



operational costs, including routine sampling, transportation, and molecular analyses, are needed. Moreover, the uneven distribution of centralized wastewater systems across the country reduces cost-efficiency, as rural and informal settlements may be excluded from surveillance networks. Overcoming these technical, institutional, contextual, and financial barriers requires coordinated, forward-looking strategies that position WBE as a sustainable and complementary approach to national public health surveillance, while ensuring equitable coverage across diverse Philippine communities.

Future directions for strengthening WBE in the Philippines

Wastewater analysis provides critical data on disease prevalence and contamination patterns, particularly in densely populated urban areas. Its

advanced capabilities in detecting and monitoring microbial and chemical contaminants enable proactive measures to mitigate disease transmission and improve pollution control. Such data can inform policymakers with evidence-based insights into public health and environmental dynamics, supporting the development of national strategies that integrate WBE into the healthcare system. Beyond health surveillance, WBE also holds transformative potential for advancing environmental sustainability in the Philippines. Collaborative partnerships among local and international research institutions, government agencies, private water concessionaires, and local water districts are essential for pooling expertise, resources, and funding to ensure the sustainability of WBE initiatives. Pilot projects across diverse regions can serve as preliminaries to assess feasibility, refine



methodologies, and address challenges on a smaller scale before nationwide adoption. Together, these collaborative efforts and pilot programs can establish the foundation for an effective, scalable WBE system in the Philippines. In general, by fostering collaboration, piloting region-specific initiatives, and embedding WBE into national health and environmental policies, the Philippines can position it as a sustainable and complementary pillar of public health surveillance and environmental management.

CONCLUSION

Wastewater microbial studies in the Philippines demonstrated the importance of wastewater as a useful environmental resource to characterize the health status of local communities and identify gaps in sanitation infrastructures. WBE contributes directly to several SDGs, advancing health, sanitation, innovation,

sustainable urban development, responsible consumption, and global partnerships. However, despite this alignment, the implementation of WBE in the Philippines at a national level remains challenged by technical, institutional, contextual, and financial barriers. Addressing these challenges through coordinated, collaborative, and phased strategies is essential to maximize the implementation of WBE in the Philippines. By including WBE into national health and environmental policies, the Philippines can utilize it as a sustainable and complementary support of public health surveillance and environmental management, strengthening preparedness for future health challenges.

REFERENCES

Aguilar, Y., Tadosa, E., & Tondo, J. (2014). A comparative study on wastewater treatment methods of selected multinational and local



- beverage companies in the Philippines and their effects on the environment. *International Journal of Environmental Science and Development*, 5(6), 570–574.
- Amarille, M. C., & Balomaga, C. A. (2021). Awareness and practices on domestic wastewater sanitation of select coastal barangays in Surigao City, Philippines. *Journal of Ecosystem Sciences and Eco-Governance*, 3(1), 14–24.
- Apostol, L. N., Imagawa, T., Suzuki, A., Masago, Y., Lupisan, S., Olveda, R., Saito, M., Omura, T., & Oshitani, H. (2012). Genetic diversity and molecular characterization of enteroviruses from sewage-polluted urban and rural rivers in the Philippines. *Virus Genes*, 45(2), 207–217.
- Apostol, L. N., Valencia, M. A. L., Nicolasora, A., Saito, M., Oshitani, H., & Lumandas, M. (2023). Metavirome in sewage and fecally-tainted river waters in the Philippines: Highlighting the role of environmental surveillance in the COVID-19 pandemic. *International Journal of Infectious Diseases*, 120(Supplement 2), Article S79.
- Australian River Corridor and Wetland Assessment South Australia (ARCOWA). (2018). *Wastewater management and resource recovery in the Philippines: Current status and opportunities*. https://seaknowledgebank.net/sites/default/files/wastewater_management_and_resource_recovery_in_Philippines_0.pdf
- Banaticla, J. E., & Rivera, W. L. (2011). Detection and subtype identification of blastocystis isolates from wastewater samples in the Philippines. *Journal of Water and Health*, 9(1), 128–137.
- Das, A., Saha, A. K., Sarkar, S., Sadhu, S., Sur, T., Agarwal, S., Mazumdar, S., Bashar, S., Tarafdar,



- S., & Parvez, S. S. (2022). A multidimensional study of wastewater treatment. *International Journal of Experimental Research and Review*, 28, 30–37.
- Gitter, A., Oghuan, J., Godbole, A. R., Chavarria, C. A., Monserrat, C., Hu, T., Wang, Y., Maresso, A. W., Hanson, B. M., Mena, K. D., & Wu, F. (2023). Not a waste: Wastewater surveillance to enhance public health. *Frontiers in Chemical Engineering*, 4.
- Hou, C., Hua, Z., Xu, P., Xu, H., Wang, Y., Liao, J., & Di, B. (2020). Estimating the prevalence of hepatitis B by wastewater-based epidemiology in 19 cities in China. *Science of the Total Environment*, 740, Article 139696.
- Imagawa, T., Saito, M., Yamamoto, D., Saito-Obata, M., Masago, Y., Ablola, A. C., Tandoc III, A. O., Segubre-Mercado, E., Lupisan, S. P., & Oshitani, H. (2020). Genetic diversity of species A rotaviruses detected in clinical and environmental samples, including porcine-like rotaviruses from hospitalized children in the Philippines. *Infection, Genetics and Evolution*, 85, Article 104465.
- Inson, J. G. M., Malla, B., Amalin, D. M., Carvajal, T. M., Enriquez, M. L. D., Hirai, S., Raya, S., Rahmani, A. F., Angga, M. S., Sthapit, N., Shrestha, S., Ruti, A. A., Takeda, T., Kitajima, M., Alam, Z. F., & Haramoto, E. (2024). Detection of SARS-CoV-2 and Omicron variant RNA in wastewater samples from Manila, Philippines. *Science of the Total Environment*, 919, Article 170921.
- Jalilov, S.-M. (2017). Value of clean water resources: Estimating the water quality improvement in Metro Manila, Philippines. *Resources*, 7(1), Article 1.



- Mahmood, T., Momin, S., Ali, R., Naeem, A., & Khan, A. (2022). Technologies for removal of emerging contaminants from wastewater. *Wastewater Treatment*.
<https://doi.org/10.5772/intechopen.104466>
- Mendoza, M. V., & Rivera, W. L. (2019). Identification of *Leptospira* spp. from environmental sources in areas with high human Leptospirosis incidence in the 89 Philippines. *Pathogens and Global Health*, 113(3), 109–116.
- Nada, M. A. L., Ancla, J. B., Yadao, N. M. R., de Paz, V. P., Manalaysay, J. G., Samante, F. L. D., & Bigol, U. G. (2023). Isolation and genome sequencing of five lytic bacteriophages from hospital wastewater in the Philippines. *Microbial Resource Announcements*, 12, Article e00311-23.
- O’Keeffe, J. (2021). Wastewater-based epidemiology: Current uses and future opportunities as a public health surveillance tool. *Environmental Health Review*, 64(3), 44–52.
- Otero, M. C., Murao, L. A., Limen, M. A., Caalim, D. R., Gaite, P. L., Bacus, M. G., Acaso, J. T., Miguel, R. M., Corazo, K., Knot, I. E., Sajonia, H., de los Reyes, F. L., Jaraula, C. M., Baja, E. S., & Del Mundo, D. M. (2022). Multifaceted assessment of wastewater-based epidemiology for SARS-CoV-2 in selected urban communities in Davao City, Philippines: A pilot study. *International Journal of Environmental Research and Public Health*, 19(14), Article 8789.
- Paraoan, C. E., Rivera, W. L., & Vital, P. G. (2017). Detection of class I and II integrons for the assessment of antibiotic and multidrug resistance among *Escherichia coli*



- isolates from agricultural irrigation waters in Bulacan, Philippines. *Journal of Environmental Science and Health, Part B: Pesticides, Food Contaminants, and Agricultural Wastes*, 52(5), 306–313.
- Raya, S., Tandukar, S., Kattel, H. P., Sharma, S., Sangsanont, J., Sirikanchana, K., Ngo, H. T. T., Inson, J. G. M., Enriquez, M. L. D., Alam, Z. F., Setiyawan, A. S., Setiadi, T., & Haramoto, E. (2024). Prevalence of Hepatitis A and E viruses in wastewater in Asian communities. *Science of the Total Environment*, 951, Article 175473.
- Robredo, J. P., Eala, M. A., Marquez, N. D., & Camiling-Alfonso, R. (2022). The costs of inadequate toilet coverage in the Philippines. *The Lancet Gastroenterology & Hepatology*, 7(5), Article 387.
- Saito, M., Villanueva, S. Y. A. M., Chakraborty, A., Miyahara, S., Segawa, T., Asoh, T., Ozuru, R., Gloriani, N. G., Yanagihara, Y., & Yoshida, S. (2013). Comparative analysis of *Leptospira* strains isolated from environmental soil and water in the Philippines and Japan. *Applied and Environmental Microbiology*, 79.
- Senta, I., Rodríguez-Mozaz, S., Corominas, L., & Petrovic, M. (2020). Wastewater-based epidemiology to assess human exposure to personal care and household products - a review of biomarkers, analytical methods, and applications. *Trends in Environmental Analytical Chemistry*, 28, Article e00103.
- Sepúlveda-Muñoz, C. A., de Godos, I., & Muñoz, R. (2023). Wastewater treatment using photosynthetic microorganisms. *Symmetry*, 15(2), Article 525.
- Shrestha, S., Malla, B., Sangsanont, J., Sirikanchana, K., Ngo, H. T. T.,



- Inson, J. G. M., Enriquez, M. L. D., Alam, Z. F., Setiyawan, A. S., Setiadi, T., Takeda, T., Kitajima, M., Haramoto, E. (2024). Detection of enteroviruses related to hand foot and mouth disease in wastewater of Asian countries. *Science of the Total Environment*, 912, Article 169375.
- Sims, N., & Kasprzyk-Hordern, B. (2020). Future perspectives of wastewater-based epidemiology: Monitoring infectious disease spread and resistance to the community level. *Environment International*, 139, Article 105689.
- Sridhar, J., Parit, R., Boopalakrishnan, G., Rexliene, M. J., Praveen, R., & Viswanathan, B. (2022). Importance of wastewater-based epidemiology for detecting and monitoring SARS-COV-2. *Case Studies in Chemical and Environmental Engineering*, 6, Article 100241.
- Suzuki, Y., Nazareno, P. J., Nakano, R., Mondoy, M., Nakano, A., Bugayong, M. P., Bilar, J., Perez, M., Medina, E. J., Saito-Obata, M., Saito, M., Nakashima, K., Oshitani, H., & Yano, H. (2020). Environmental presence and genetic characteristics of carbapenemase-producing Enterobacteriaceae from hospital sewage and river water in the Philippines. *Applied and Environmental Microbiology*, 86(2).
- Tolenada, C. P., & Dayrit, G. (2022). Clinically relevant antibiotic resistant Enterobacteriaceae from hospital wastewater in Metro Manila, Philippines. *Clinica Chimica Acta*, 530, S297-S324.
- Tuddao, V. B. (2021, March 1-2). Updates on domestic wastewater management in the Philippines. *The 16th Water Environment Partnership in Asia Annual Meeting*.



<https://wepa-db.net/wp-content/themes/wepa/pdf/the-16th-wepa-annu>

[al-meeting-and-international-works-hop-10.pdf](#)



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***Knowledge, attitudes, and practices on the control and
prevention of soil-transmitted helminthiases among residents
of San Antonio, Quezon, Philippines***

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ABSTRACT

Soil-transmitted helminths (STH) is one of the neglected tropical diseases that affects more than 48 million children in the Philippines. Despite the implementation of control and prevention strategies such as mass drug administration, access to clean water, sanitation, hygiene, and education. This study described the knowledge, attitudes, and practices to control and prevent STH infections of the residents in San Antonio, Quezon. Single-type focus group discussions were conducted once among selected residents in eighteen (18) barangays of 20 barangays in San Antonio, Quezon. Residents demonstrated inadequate knowledge about STH's biology, signs and symptoms of infection, transmission, and epidemiology. In addition, several misconceptions about STH were mentioned by the participants such as being infected with STH has importance in one's life, a person can be infected with STH by consuming raw rice grains and sugar, and that *Amoeba* is an STH. Regarding attitudes, only the residents from 4 of the 18 barangays claimed that they followed the deworming protocol. To prevent STH infections, the residents practice washing of hands, wearing slippers or shoes, and refraining from open defecation. In general, the residents of San Antonio, Quezon practice good hygiene and sanitation; however, their source of living halts their continuous practice of behaviors that promote health. The health education strategy should be strengthened to ensure that the residents are aware of the different ways they can prevent STH infections among the members of the community.

Keywords: soil-transmitted helminths; soil-transmitted helminth infections; sanitation; and health education

INTRODUCTION

Soil-transmitted helminthiasis are one of the most common infections globally. It is considered one of the neglected tropical diseases (NTD) (Geleto, Kassa, & Erko, 2022). Currently, STH infections affect 1.5 billion people worldwide and continue to be a serious public health problem

(WHO, 2023). It affects unprivileged communities, described as areas with poor access to adequate water, sanitation, and hygiene, with most infections occurring in Asia, Africa, and Latin America (Pullan et al., 2014). The Philippines has recorded some of the highest prevalence levels of STH infections in Southeast Asia.



Improving health education and hygiene awareness can benefit impoverished communities with diseases related to poverty, such as STH infections, as it is a sustainable approach to adapt and disseminate in communities where resources are scarce. By developing a community knowledgeable about the possible risks and sequelae of STH infection and the benefits of developing good hygiene practices, the residents will be less vulnerable to these infections. The availability of baseline data on knowledge, attitudes and practices regarding soil-transmitted helminthiases in this municipality is necessary to develop appropriate control strategies for the residents. Lastly, this study promotes the following United Nations Sustainable Development Goals—No Poverty; Good Health and Well-being; and

Clean Water and Sanitation. Thus, a study on the knowledge, attitudes, and practices is also crucial in understanding the problems regarding the implementation of MDA and WASH.

The study described the knowledge, attitudes, and practices regarding the control and prevention of STH infections of San Antonio, Quezon residents.

METHODOLOGY

The research followed a qualitative research design. Stratified sampling was used to select the participants for the discussion, wherein each barangay represents a stratum. The sampling population was limited to individuals who had been residing in the barangay for at least six (6) months, and age was restricted to those who were at least 18 years old. Barangay



chairman, deputies (kagawad), and other employees were prohibited from joining the discussion. They were also asked to leave the discussion area to eliminate bias.

The researcher served as the moderator for the FGD. The discussion started by introducing the researcher, the nature of the research, and the data that need to be collected. Consent from the participants was gathered prior to the conduct of the discussion. Responses were collected through video recording as well as notetaking of responses given the questionnaire. In the end, the duration of the meeting lasted around 30 to 45 minutes.

Permission and approval to conduct group interviews in 18 barangays of San Antonio, Quezon Province was obtained from the De La Salle University Research Ethics

Office and the Municipal Mayor's Office. Afterward, permission to conduct FGD in every barangay was obtained from the barangay chairman and/or kagawad if the chairman was unavailable. Moreover, informed consent from the residents was gathered before the conduct of the discussion and residents were informed that the entire discussion and their responses were recorded. For residents who refused to give consent and were unwilling to participate, other residents served as substitutes. Letters were assigned on random barangays to provide anonymity for the residents. Finally, results from the discussion will be provided to the local government.



RESULTS AND DISCUSSION

Knowledge About STH and STH Infections

Out of eighteen (18) barangays where the FGD was conducted, sixteen (16) (88.89%) barangays claim to have knowledge about STH. These are Barangay E, D, F, H, P, L, D, C, Q, J, M, A, N, I, R. Meanwhile, only two (2) barangays: Brgy. G and Brgy. O, attested having no knowledge about STH. Residents of Brgy. O claimed to have heard about STH but had not fully learned about it. On the other hand, the respondents from Brgy. G have stated that they neither heard nor have had any knowledge about STH. In a study conducted by Parikh et al., in 2013, the respondents had adequate knowledge about STH prevention and supported the prevention of open defecation.

Furthermore, many of the respondents, consisting of parents and teachers, believed that STH was a major problem. In another study, the majority (62.6%) of the participants have knowledge of parasitic infections. However, the same respondents have no knowledge on how they become infected with parasitic worms (Oyebamiji et al., 2018). Similarly, there was inadequate knowledge, attitudes, and practices (87%) in relation to STH according to the study of Gwebu et al., 2019. The study also showed that adequate knowledge on the transmission, prevention, signs, and symptoms as well as the life cycle of STH was low (below 50%) among those who have heard of the disease. In a study conducted by Gyorkos et al., (2013), school-based health hygiene education intervention was found to be effective in increasing STH knowledge



and in reducing *Ascaris lumbricoides* infection. The intensity of *A. lumbricoides* infection in schools where health hygiene and sanitation activities were done every two weeks over four months was lower by 58% than schools with no intervention conducted (aIRR=0.42; 95% CI=0.21 to 0.85).

Table 1. Number of barangays with knowledge about STH

Responses	Yes (%)	No (%)
Barangays with residents who are knowledgeable about STH	16 (88.89%) (E, D, F,H, P, L, D, C, Q, J, M, A, N, I, R)	2 (11.11%) (G, O)

Knowledge About STH

Majority of the residents have stated that STH can cause weight loss and malnutrition (4 out of 18 barangays; 22.22%) which corresponds to the study by Yeshanew et al., (2022), stating that the high

prevalence of STH has a significant association with undernutrition among school age children. Another response generated from the discussion was that STH can cause diarrhea (3 out of 18 barangays, 16.67%), fever (1 out of 18 barangays, 5.56%), lethargy (1 out of 18 barangays, 5.56%), sleep deprivation (1 out of 18 barangays, 5.56%), and abdominal enlargement (1 out of 18 barangays, 5.56%). These coincide with epidemiological studies reporting that helminth-infected school-age children have lower health outcomes including lethargy, stunting, wasting and anemia (Grantham-McGregor, 2002). A lower performance on a range of cognitive tests is also observed yet not fully understood (Dickson et al., 2000). Meanwhile, iron deficiency anemia associated with helminth infection is thought to be an important factor to



lower health outcomes in infected children (Crompton, 2000; de Silva et al., 2003; Grigorenko et al., 2006). Some of the notable statements from the residents were as follows:

“Ito ay nagiging dahilan ng pagtatae” (residents of Barangays A, B, and L).

“Nagiging sanhi ng paglaki ng tiyan, matamlay, puyat, at lagnat” (residents of Barangay C).

“Nagiging dahilan ng malnutrisyon” (residents of Barangay R).

It is notable that most barangays and its residents have knowledge of STH. However, there are several misconceptions that were also stated. Rural communities are often marked by cultural influences which may lead to widespread misconceptions and risky practices that cascade across generations (Koffi et al., 2018). Misconceptions can lead to a distortion

in health seeking behaviors that may hinder the control efforts for STH (Sacolo-Gwebu et al., 2019). IHCP health education strategy stresses the importance of clarifying the myths and beliefs of individuals regarding the presence of helminths. It also aims to increase the understanding of the epidemiology of helminth infection, patterns of distribution as well as its mode of infection.

For instance, residents in Barangay D stated that helminths can be classified as good or bad (“May good at bad na bulate”) while residents of Barangay H consider amoeba as one of the STH. In Barangay L, residents claim that helminths are bacteria while a colloquial term “ulay” or tapeworm is used by residents from Barangay B. For the residents of Barangay M, helminths are vital in a person’s life



and an individual could not live without it.

Knowledge About How STH are Transmitted

When asked about how STH are transmitted, the residents gave the following responses:

“Nakukuha sa maruming pagkain, inumin, at paligid.”

“Nakukuha kapag di masyadong luto ang pagkain.”

“Nakukuha kapag di naghuhugas ng pinggan at naglalaro ng lupa.”

In terms of knowledge of how STH is transmitted, 5 out of 6 responses are correct. According to the study by Sacolo-Gwebu et al., (2019), community members that are empowered with accurate information can be a leverage for STH control programs. Their knowledge is important to halt the spread of infection

through behavior change strategies. Majority of the residents from 9 out of 18 barangays (50%) have stated that STH can be transmitted from ingestion of contaminated food and water. While 5 out of 18 barangays (27.78%) includes dirty surroundings and eating raw food as a mode of STH transmission, 4 out of 18 barangays (22.22%) considers improper hygiene particularly not washing of hands and trimming of nails as a main cause of infection. Lastly, 1 out of 18 barangays (5.56%) attributes playing with soil with infection. Many residents have a good knowledge about STH transmission, however, certain misconceptions persist in barangays such as STH can be transmitted by eating raw rice grains and sugar (1 out of 18 barangays, 5.56%).



Attitudes Towards the Control and Prevention of STH Infections

Table 6. Compliance with deworming protocol

Compliant	%	Noncompliant	%
4	22.22	14	77.77

In San Antonio, Quezon, there were only 4 barangays that claimed to take deworming medication. Namely, Brgy. F, H, J, and N. Most of the residents who do not comply with the deworming protocol were the elders, although some children are also hesitant to take the antihelminthic drug. According to the residents, their reasons for not taking the medication are (1) belief that they are not infected with STH and (2) fear of the possible adverse effects that come with taking the drug. The residents' hesitation started when the issue of the adverse effects of the Dengvaxia vaccine arose. The residents were afraid that

they would have health issues like those who were administered the vaccine.

According to the residents, children are required to take the antihelminthic drugs. However, when the child refuses to take it, the municipal health office does not force them. In addition, those who are enrolled in private institutions are not required to take the antihelminthic drug. Elders are also advised to take antihelminthic drugs. However, the majority of the residents have shown their disagreement concerning deworming. As a result, there were certain barangays where residents claimed that elders are not given any drugs. Meanwhile, in other barangays, the elders stated that they were given the drug but were noncompliant with the protocol.

“Napupurga every six months para lumabas ang bulate sa tae o suka.



Napupurga parehong bata at matanda” (residents of Barangay I).

“Napupurga ang mga bata sa school. Sa public mandatory, sa private, kapag ayaw ng bata, hindi pinapainom” (residents of Barangay J).

Deworming is a preventive and curative form of therapy for helminthiasis that is part of various public health campaigns. However, there is still a need for better and effective implementation of community-directed treatment (Jimam et al., 2013). According to the study by Rwamwejo et al. (2023), misconceptions and resistance may become bottlenecks to the deworming program. They hinder the timely control and elimination of infections. Thus, there is a need to strengthen health education programs, emphasizing misconceptions and the importance of deworming on child

health. In addition, an active health promotion program to enhance compliance with deworming is essential (Stanley et al., 2013).

Residents’ Practices for Control and Prevention of STH Infections

Table 7. Resident’s practices for control and prevention of STH infections

Practices	Yes	%	No	%
Use of slippers when going outside the house	15	83.33%	3	16.67%
Refraining from open defecation	12	66.67%	6	33.33%
Washing of hands before and after eating	17	94.44%	1	5.56%

During the discussion regarding control and prevention of STH infection, residents state three (3) helpful practices: use of slippers when going outside the house, refraining from open defecation and washing of hands before and after eating. Fifteen of the 18 barangays (83.33%) state that they wear slippers or footwear



when leaving the house. In other barangays, the residents stated that not everyone wears slippers or shoes when outside the house. Some of the residents, especially the farmers, are required to be barefooted when working in the fields. Direct exposure to STH-contaminated farmlands or irrigation of farms using contaminated wastewater or sludge predisposes a person to STH infections (Amoah et al., 2018). Similarly, work related to or using the land poses higher risk of contracting STH infections (Aritonang, 2019). Vegetable farmers have 9 times the risk of getting an infection caused by poor sanitation and hygiene and not wearing personal protective equipment (Ulfa et al., 2016).

The use of sanitary toilets when defecating are stated by residents of 12 out of 18 barangays (66.67%). Most of them attest to receiving sanitary

toilets from the KALAHI-CIDSS program. Other residents claim that those who do not have their own toilets share with their neighbors. Meanwhile, 6 out of 18 barangays (33.33%) have some of their residents who defecate in rivers and soil. Some of the reasons include unforeseen circumstances and happening for farmers who are in the middle of work. Some factors leading to high prevalence of STH infections in developing countries are open defecation practice, limited water source and poor hygienic conditions (Ayalew et al., 2018). A study conducted in India shows the prevalence of STH infections are higher (44%) in villages where open defecation is practiced than in villages that do not practice open defecation (36%) (Chakma et al., 2008). The implementation and application of zero open defecation can decrease the



prevalence of STH infections in a community by breaking the life cycle of STH. An open defecation-free environment prevents soil contamination and results in a decrease in prevalence of STH infections as well (Muluneh et al., 2020).

Lastly, washing of hands before and after eating is considered important by residents in 17 out of 18 barangays (94.44%). The residents have stated that their children are taught about the proper handwashing in schools which they also practice at home. It is only in 1 barangay (5.56%) where the residents stated that there are times when they forget to wash their hands before and after eating. According to UNICEF (2021), the act of cleaning hands can reduce illness by preventing the spread of infectious diseases. It has been promoted as an

effective measure against various health-related issues including neglected tropical diseases. In contrast, according to the study by Makata et al., (2021), handwashing alone may not be sufficient to reduce STH transmission. However, when handwashing is combined with water improvement and sanitation, it becomes an effective intervention in reducing STH transmission and infection (Pickering et al., 2019; Ercumen et al., 2019).

Several practices may also pose risks of STH infection among children and elders. According to WHO, children are the most vulnerable population to STH infection (Welch et al., 2016). In a study conducted by Welch et al., in 2016, children who play in playgrounds are exposed to infection since they are prone to habits such as walking barefooted, picking up



dropped foods from the ground, and biting their nails. Meanwhile, people who had or used a latrine were less likely to be infected with STH as opposed to those without latrines or never used one (Ziegelbauer et al., 2012). A study conducted by Geleto et al., (2022) stated that those who do not have a private latrine are 3.8 times more likely to be infected with STH infection (p value=0.005, AOR: 3.83, CI 1.49–9.81).

Despite continuous deworming efforts, reinfection follows if WASH conditions remain poor (WHO, 2013). Improving access to safe water supply, basic sanitation, and good hygiene practices are essential to stop the cycle of STH transmission (Hotez, et al., 2006, Ogden et al., 2013, Campbell et al., 2018). Evidence on the importance of WASH is presented in the study conducted by

Mohd-Shaharuddin et al., (2018). Results show that the risk factors for STH infections are defecating indiscriminately, absence of latrine facilities at home, and using untreated water for daily activities. Control measures regarding these risk factors must be applied to eliminate STH (Mohd-Shaharuddin et al., 2018). The sustainable development goals implicitly highlight the need to expand WASH programs beyond the household setting. A study conducted by Belo (2012) stated that the existence of a toilet in the house reduced the rate of infection, as the mode of transmission of helminths is associated with ground contamination.

CONCLUSION

Health education is one of the strategies of the IHCP. Children are taught about STH and STH control and



prevention through the WASH-in-schools program of DepEd. Despite efforts to provide adequate information about STH, there were residents who were still unaware of the potential risks and hazards of STH infections. The majority of the residents coming from different barangays had little knowledge about STH. However, several misconceptions about STH were stated by a few residents. This poses a concern for everyone, especially the local municipality, as this can increase the risk of infections and reinfections among the residents. Despite their current knowledge about STH, there are a lot more concepts that the residents should know about the parasite and how they become at risk of infection. Overall, the residents had inadequate knowledge about STH.

The residents showed a negative attitude towards deworming -one of the strategies of the IHCP. Their negative attitude stems from the inadequate knowledge and beliefs in the misconceptions about STH. The concern about the adverse drug reactions of Dengvaxia vaccine has greatly contributed to the negative attitude of the residents towards deworming. Because of this, majority of the residents became hesitant in taking the antihelminthic drug. This hinders the effective control and eradication of STH infections among the residents of the municipality.

The residents exhibited good hygiene and sanitation practices. They were able to enumerate key strategies about hygiene and sanitation that they practice every day. These good practices help prevent infections and reinfections among the residents.



However, their nature of work hinders them from doing these practices regularly. This poses an increased risk of infection, especially for farmers and fishermen who come in contact with a possibly contaminated environment.

A program concerning the control and prevention of STH is ongoing. Follow-up on the IHCP is integral to know if they are being appropriately implemented. While it is inevitable that preventive chemotherapy and WASH strategies are the focus of STH control programs, education should also be given equal importance. STH infects a wide range of hosts. The program should also consider looking into the animal reservoir to control and eliminate STH infections. With these, the recommendations are (1) follow-up and assessment on the implementation of the deworming programs; (2) identification of the

presence of STH among the residents of San Antonio, Quezon; (3) determination of the prevalence of STH among the residents of San Antonio, Quezon; (4) determination of STH contamination in soil; (5) assessment of the implementation of deworming programs for animals; and, (6) identification of presence and prevalence of STH infection in livestock and other animals in the municipality.

REFERENCES

- Aiyedun J. O. & Oludairo, O. O. (2016). Prevalence of intestinal parasitism of swine in a North Central State of Nigeria. *Journal of Advanced Veterinary and Animal Research*, 3(3), 278-281.
- Amoah, I., Adegoke, A., & Stenstrom, T. (2018). Soil-transmitted helminth infections associated with



- wastewater and sludge reuse: A review of current evidence. *Tropical Medicine and International Health*. 23(7), 692-703.
- Aritonang B. N. (2019). Relationship of personal hygiene with worm disease (soil transmitted helminth) in kartama vegetable farmers in Pekanbaru City. *Journal of Medical Laboratory Science and Technology*, 4(2), 39–43.
- Ayalew, A. M., Mekonnen, W. T., Abaya, S.W., Mekonnen, Z.A., (2018). Assessment of diarrhea and its associated factors in under-five children among open defecation and open defecation-free rural settings of Dangla district, northwest Ethiopia. *Journal of Environmental and Public Health*, Article 4271915.
- Belo, V. S., de Oliveira, R. B., Fernandes, P. C., Nascimento, B. W. L., Fernandes, F. V., Castro, C. L. F., dos Santos, W. B., & da Silva, E. S. (2013). Factors associated with intestinal parasitosis in a population of children and adolescents. *Revista Paulista de Pediatria*, 30(2), 195-201.
- Bethony, J., Brooker, S., Albonico, M., Geiger, S. M., Loukas, A., Diemert, D., & Hotez, P. J. (2006). Soil-transmitted helminth infections: Ascariasis, trichuriasis, and hookworm. *Lancet*, 367,1521–32.
- Boatin, B. A., Basanez, M. G., Prichard, R. K., Awadzi, K., Barakat, R. M., García, H. H., Gazzinelli, A., Grant, W. N., McCarthy, J. S., N'Goran, E. K., Osei-Atweneboana, M. Y., Sripa, B., Yang, G. J., & Lustigman, S. (2012). A research agenda for helminth diseases of humans: Towards control and elimination.



- PLoS Neglected Tropical Diseases*. 6(4), Article e1547.
- Boonjaraspinyo, S., Boonmars, T., Kaewsamut, B., Ekobol, N., Laummaunwai, P., Aukkanimart, R., Wonkchalee, N., Juasook, A., & Sriraj, P. (2013). A cross-sectional study on intestinal parasitic infections in rural communities, northeast Thailand. *The Korean Journal of Parasitology*, 51(6), 727–734.
- Brahmantya, I. B. Y, Iqra, H. H. P., Hartawan, I. G. N. B. R. M., Anjani, I. A. W, Sudarmaja, I.M., & Ryalino, C. (2020). Risk factors and prevalence of soil-transmitted helminth infections. *Open Access Macedonian Journal of Medical Science*; 8(A), 521-524.
- Campbell, S. J., Biritwum, N. K., Woods, G., Velleman, Y., Fleming, F., & Stothard, J. R. (2018). Tailoring water, sanitation, and hygiene (WASH) targets for soil-transmitted helminthiasis and schistosomiasis control. *Trends in Parasitology*, 34(1), 53-63.
- Chakma, T., Godfrey, S., Bhatt, J., Rao, P. V., Meshram, P., & Kinyanjui, S. S., (2008). Cross-sectional health indicator study of open defecation-free villages in Madhya Pradesh, India. *Waterlines* 27, 236–247.
- Crompton, D. W. (2000). The public health importance of hookworm disease. *Parasitology*, 121(Supplement), S39–50.
- Czeresnia, J. M. & Weiss, L. M. (2022). *Strongyloides stercoralis*. *Lung*, 200, 141–148.
- de Silva, N. R., Brooker, S., Hotez, P. J., Montresor, A., Engels, D., & Savioli, L. (2003). Soil-transmitted helminth infections: Updating the



- global picture. *Trends in Parasitology*, 19(12), 547–551.
- De Silva, N. (2014). India can do more about intestinal worm infections. *Indian Journal of Medical Research*, 139, 7–9.
- Department of Health (2006). *Strategic and operational framework for establishing integrated helminth control program*.
- Dhaka, R., Verma, R., Kumar, R., Chayal, V., Bhalla, K., Singh, R., Agrawal, G., & Kupal, G. (2019). Pattern and determinants of soil-transmitted helminthiasis in a rural area of Haryana: A school-based study. *Journal of Family Medicine and Primary Care*, 8(6), 1971-1975.
- Dickson, R., Awasthi, S., Williamson, P., Demellweek, C., & Garner, P. (2000). Effects of treatment for intestinal helminth infection on growth and cognitive performance in children: Systematic review of randomised trials. *BMJ*, 320(7251), 1697–701.
- Ercumen, A., Benjamin-Chung, J., Arnold, B. F., Lin, A., Hubbard, A. E., Stewart, C., Rahman, Z., Parvez, S. M., Unicomb, L., Rahman, M., Haque, R., Colford, J. M., & Luby, S. P. (2019). Effects of water, sanitation, handwashing and nutritional interventions on soil-transmitted helminth infections in young children: A cluster-randomized controlled trial in rural Bangladesh. *PLoS Neglected Tropical Diseases*, 13(5), Article e0007323.
- Feldman, M., Friedman, L. S., & Brandt, L. J. (Eds.). (2020). *Sleisenger and Fordtran's gastrointestinal and liver disease*:



- Pathophysiology, diagnosis, management (11th ed.). Elsevier.
- Geleto, G., Kassa, T., Erko, B. (2022). Epidemiology of soil-transmitted helminthiasis and associated malnutrition among under-fives in conflict affected areas in southern Ethiopia. *Tropical Medicine and Health*, 50, Article 44.
- Grimes, J. E. T., Tadesse, G., Mekete, K., Wuletaw, Y., Gebretsadik, A., French, M. D., Harrison, W. E., Drake, L. J., Gardiner, I. A., Yard, E., & Templeton, M. R.. (2016). School water, sanitation, and hygiene, soil-transmitted helminths, and schistosomes: National mapping in Ethiopia. *PLoS Neglected Tropical Diseases*, 10(3), Article e0004515.
- Grantham-McGregor, S. (2002). Linear growth retardation and cognition. *Lancet*, 359(9306), Article 542.
- Grigorenko, E. L., Sternberg, R. J., Jukes, M., Alcock, K., Lambo, J., Ngorosho, D., Nokes, C., & Bundy, D. A. (2006). Effects of antiparasitic treatment on dynamically and statically tested cognitive skills over time. *Journal of Applied Developmental Psychology*, 27, 499–526.
- Gyorkos, T. W., Maheu-Giroux, M., Blouin, B., & Casapia, M. (2013). Impact of health education on soil-transmitted helminth infections in schoolchildren of the Peruvian Amazon: A cluster-randomized controlled trial. *PLoS Neglected Tropical Diseases*, 7(9). Article e2397.
- Gyorkos, T. W. & Gilbert, N. L. (2014). Blood drain: Soil-transmitted helminths and anemia in pregnant women. *PLoS Neglected Tropical Diseases*, 8(7), Article e2912.



- Hossain, M. & Bhuiyan, M. J. U. (2016). Hookworm infection: A neglected tropical disease of mankind. *Journal of Infection and Molecular Biology*, 4(2), 24-43.
- Hotez, P. J., Bundy, D. A. P., Beegle, K., Brooker, S., Drake, L., De Silva, N., Montresor, A., Engels, D., Jukes, M., Chitsulo, L., Chow, J., Laxminarayan, R., Michaud, C., Bethony, J., Correa-Oliveira, R., Shuhua, X., Fenwick, A., & Savioli, L. Helminth infections: Soil-transmitted helminth infections and schistosomiasis. In D. T. Jamison, J. G. Breman, A. R. Measham, G. Alleyne, M. Claeson, D. B. Evans, P. Jha, A. Mills, & P. Musgrove (Eds.), *Disease control priorities in developing countries* (2nd ed., pp. 467–82). Oxford University Press.
- Iowa State University. (2013). *Zoonotic hookworms*. <https://www.cfsph.iastate.edu/Factsheets/pdfs/hookworms.pdf>
- Islamudin, R. A., Suwandono, A., Saraswati, L. D., & Putri, R. K. (2018). The association between soil transmitted helminth infections with nutritional status in children (a cross sectional study in elementary school, Candi Village, Semarang District, Central Java Province, Indonesia). *KnE Life Sciences*, 288-295.
- Jimam, N. S., Wetkos, D. D., Falang, K. D., David, S., & Akpor, O. J. (2013). Assessment of the knowledge, attitude and awareness of residents of Jos, Plateau State, Nigeria, towards worm infestation and de-worming. *African Journal of Pharmacy and Pharmacology*, 7(17), 886-892.



- Jiraanankul, V., Aphijirawat, W., Mungthin, M., Khositnithikul, R., Rangsin, R., Traub, R.J., Piyaraj, P., Naaglor, T., Taamasri, P., & Leelayoova, S. (2011). Incidence and risk factors of hookworm infection in a rural community of central Thailand. *American Journal of Tropical Medicine and Hygiene*, *84*, 594–598.
- Kitvatanachai, S., Boonslip, S., & Watanasatitarpa, S. (2008). Intestinal parasitic infections in Srimum suburban area of Nakhon Ratchasima Province, Thailand. *Tropical Biomedicine*, *25*, 237–242.
- Koffi A. J. D, Doumbiua, M., Fokuo, G., Keita, G., Kone, B., & Abe, N. N. (2018). Community knowledge, attitudes and practices related to schistosomiasis and associated healthcare-seeking behaviours in northern Côte d'Ivoire and southern Mauritania. *Infectious Diseases of Poverty*, *7*(1), Article 70.
- Lu, L., Liu, C., Zhang, L., Medina, A., Smith, S., Rozelle, S. (2015). Gut instincts: Knowledge, attitudes, and practices regarding soil-transmitted helminths in rural China. *PLoS Neglected Tropical Diseases*, *9*(3), Article e0003643.
- Makata, K., Ensink, J., Ayieko, P., Hansen, C., Sichalwe, S., Mngara, J., Mcharo, O., Mazigo, H., Seni, J., Dreibelbis, R., Rockowitz, S., Okello, E., Grosskurth, H., Kinung'hi, S., Kapiga, S. (2021). Hand hygiene intervention to optimize soil-transmitted helminth infection control among primary school children: The Mikono Safi cluster randomised controlled trial in northwestern Tanzania. *BMC Medicine*, *19*(1), Article 125.



- Mohd-Shaharuddin, N., Lim, Y. A. L., Hassan, N. A., Nathan, S., & Ngui, R. (2018). Soil-transmitted helminthiasis among indigenous communities in Malaysia: Is this the endless malady with no solution? *Tropical Biomedicine*, 35(1), 168-180.
- Montresor, A., Gabrielli, A. F., Chitsulo, L., Ichimori, K., Mariotti, S., Engels, D., & Savioli, L. (2012). Preventive chemotherapy and the fight against neglected tropical diseases. *Expert Review of Anti-infective Therapy*, 10, 237–242.
- Muluneh, C., Hailu, T., & Alemu, G. (2020). Prevalence and associated factors of soil-transmitted helminth infections among children living with and without open defecation practices in northwest Ethiopia: A comparative cross-sectional study. *American Journal of Tropical Medicine and Hygiene*. 103(1), 266-272.
- Negussu, N., Mengistu, B., Kebede, B., Deribe, K., Ejigu, E., Tadesse, G., Mekete, K., & Sileshi, M. (2017). Ethiopia schistosomiasis and soil-transmitted helminths control programme: Progress and prospects. *Ethiopia Medical Journal*, 55(Supplement 1), 75–80.
- Ogden, S., Gallo, K., Davis, S., McGuire, C., Meyer, E., Addiss, D., & Haddad, D. (2013). *WASH and the neglected tropical diseases: A global manual for WASH implementers*. Sightsaver.
- Oyebamiji, D., Ebisike, A., Egede, J., & Hassan, A. (2018). Knowledge, attitude and practice with respect to soil contamination by soil-transmitted helminths in Ibadan, Southwestern Nigeria.



- Parasite Epidemiology and Control*, 3(4).
- Parikh, D. S., Totañes, F. I., Tuliao, A. H., Ciro, R. N., Macatangay, B. J., & Belizario, V. Y. (2013). Knowledge, attitudes and practices among parents and teachers about soil-transmitted helminthiasis control programs for school children in Guimaras, Philippines. *The Southeast Asian Journal of Tropical Medicine and Public Health*, 44(5), 744-52.
- Pickering, A. J., Njenga, S. M., Steinbaum, L., Swarthout, J., Lin, A., Arnold, B. F., Stewart, C. P., Dentz, H. N., Mureithi, M. A., Chieng, B., Wolfe, M., Mahoney, R., Kihara, J., Byrd, K., Rao, G., Meerkerk, T., Cheruiyot, P., Papaikovou, M., Pilotte, N., Williams, S. A., Colford, J. M., & Null, C. (2019). Effects of single and integrated water, sanitation, handwashing, and nutrition interventions on child soil-transmitted helminth and Giardia infections: A cluster-randomized controlled trial in rural Kenya. *PLoS Medicine*, 16(6), Article e1002841.
- Prüss-Ustün, A., Wolf, J., Bartram, J., Clasen, T., Cumming, O., Freeman, M. C., Gordon, B., Hunter, P. R., Medlicott, K., & Johnston, R. (2019). Burden of disease from inadequate water, sanitation and hygiene for selected adverse health outcomes: An updated analysis with a focus on low- and middle-income countries. *International Journal of Hygiene and Environmental Health*, 222(5), 765–777.
- Pullan, R. L., Smith, J. L., Jasrasaria, R., & Brooker, S. J. (2014). Global



- numbers of infection and disease burden of soil transmitted helminth infections in 2010. *Parasites & Vectors*, 7, Article 37.
- Rwamwejo, F., Ndatinya, G. I., Mkata, M. I., Blauman, A., Regnier, D., & Lackner, S. C. (2023). Assessing the knowledge, attitudes, practices, and perspectives of stakeholders of the deworming program in rural Rwanda. *PLoS Neglected Tropical Diseases*, 17(8), Article e0010759.
- Sacolo-Gwebu, H., Kabuyaya, M., Chimabri, M. (2019). Knowledge, attitudes and practices on schistosomiasis and soil-transmitted helminths among caregivers in Ingwavuma area in uMkhanyakude district, South Africa. *BMC Infectious Diseases*. 19(734).
- Sacolo, H., Chimbari, M., & Kalinda, C. (2018). Knowledge, attitudes and practices on schistosomiasis in sub-Saharan Africa: A systematic review. *BMC Infectious Diseases*, 18(1), Article 46.
- Satriani, S., Ilma, I., & Daniel, D. (2022). Trends of water, sanitation, and hygiene (WASH) research in Indonesia: A systematic review. *International Journal of Environmental Research and Public Health*, 19(3), Article 1617.
- Schatz, E. J. (2007). Taking care of my own blood: Older women's relationships to their households in rural South Africa. *Scandinavian Journal of Public Health Supplements*, 69, 147–54.
- Stanley, C. N., Oreh, N. C., & Johnson-Ajinwo, R. O. (2013). Knowledge, attitudes and practices of intermittent deworming in Alakahia Community, Rivers State, Nigeria. *International Research*



- Journal of Medical Sciences*, 1(7), 1-7.
- Strunz, E. C., Addiss, D. G., Stocks, M. E., Ogden, S., Utzinger, J., & Freeman, M. C. (2014). Water, sanitation, hygiene, and soil-transmitted helminth infection: A systematic review and meta-Analysis. *PLoS Medicine*, 11(3), Article e1001620.
- Taylor-Robinson, D., Maayan, N., Donegan, S., Chaplin, M., & Garner, P. (2019). Public health deworming programmes for soil-transmitted helminths in children living in endemic areas. *Cochrane Database Systematic Review*, 9(9), Article CD000371.
- Ulfa Ali, R., Zulkarnaini, Z., Affandi, D. (2016). Relationship of personal hygiene and environmental sanitation with the incidence of STH. *Din Lingkungan Indonesia*, 3(1), Article 24.
- United Nations Children's Fund & World Health Organization. (2021). *State of the world's hand hygiene: A global call to action to make hand hygiene a priority in policy and practice*. UNICEF.
- Valerio, L., Roure, S., Fernandez-Rivas, G., Basile, L., Martinez-Cuevas, O., Ballesteros, A. L., Ramos, X., Sabria, M., & North Metropolitan Working Group on Imported Diseases. (2013). *Strongyloides stercoralis*, the hidden worm. Epidemiological and clinical characteristics of 70 cases diagnosed in the North Metropolitan Area of Barcelona, Spain, 2003–2012. *Royal Society of Tropical Medicine and Hygiene*, 107(8), 465–470.



Wang, J. L., Li, T. T., Huang, S. Y., Cong, W., Zhu, X. Q. (2016). Major parasitic diseases of poverty in mainland China: Perspectives for better control. *Infectious Diseases of Poverty*, 5(1), Article 67.

Welch, V. A., Ghogomu, E., Hossain, A., Awasthi, S., Bhutta, Z., Cumberbatch, C., Fletcher, R., McGowan, J., Krishnaratne, S., Kristjansson, E., Sohani, S., Suresh, S., Tugwell, P., White, H., Wells, G. (2016). Deworming and adjuvant interventions for improving the developmental health and well-being of children in low-and middle-income countries: A systematic review and network meta-analysis. *Campbell Systematic Reviews*, 12(1), 1-383.

World Health Organization (WHO). (2002). *Prevention and control of schistosomiasis and*

soil-transmitted helminthiasis: Report of a WHO expert committee.

<https://iris.who.int/server/api/core/bitstreams/b1a62376-85c4-4dac-83e2-e7c8c14d5524/content>

WHO. (2011). *Helminth control in school age children: A guide for managers of control programmes.* <https://iris.who.int/server/api/core/bitstreams/0a703f88-fdde-45c7-ae33-a81b954af7b2/content>

WHO. (2013). *Neglected tropical diseases* (WHA66.12). <https://iris.who.int/server/api/core/bitstreams/e0bb643e-e648-4906-b154-691e68908433/content>

WHO. (2020). Soil-transmitted helminth infections. <https://www.who.int/news-room/fact-sheets/detail/soil-transmitted-helminth-infections>



Yeshanew, S., Bekana, T., Truneh, Z.,
Tadege, M., Abich, E., & Dessie, H.
(2022). Soil-transmitted
helminthiasis and undernutrition
among schoolchildren in Mettu
town, Southwest Ethiopia. *Scientific
Reports*, 12(1), Article 3614.

Ziegelbauer, K., Speich, B.,
Mäusezahl, D., Bos, R., Keiser, J.,
& Utzinger, J. (2012). Effect of
sanitation on soil-transmitted
helminth infection: Systematic
review and meta-analysis. *PLoS
Medicine*, 9(1), Article e1001162.



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