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**Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method
Study Situating Disaster Resilience through ICT-Based Management in
Pamarawan Island, Malolos City**

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18 August 2025

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SAILING ACROSS BRACKISH WATERS: AN EXPLORATORY SEQUENTIAL MIXED-METHOD STUDY SITUATING DISASTER RESILIENCE THROUGH ICT-BASED MANAGEMENT IN PAMARAWAN ISLAND, MALOLOS CITY

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August 18, 2025

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Biographical Sketch

Shedorlaomar Clavio Corales was born on December 17, 2002. He was raised in two neighboring lands of Bulacan: Bulakan and Malolos City. Shedor has been taught and observing resilience throughout the two communities. Shedor is a queer student-researcher, campus journalist, writer, and artist, currently working as a content writer at Metro Manila. He was a former feature and opinion writer at KALASAG and former publicity committee head at UP LAKAN. He was also a selected fellow for the ASEAN-EU Summer School spearheaded by STEAR Think Tank and UP Tacloban College. Through his sheer curiosity about both physical and digital spaces, he ventured on different research inquiries like queer studies, DRRM, and literary criticism and participated in different events. In 2023, he became the first e-skolar to participate as a finalist in the Japanese Studies Research Development Competition, spearheaded by the UP Asian Center and the Japan Foundation, Manila. For this competition, he wrote a film analysis for the 2021 Japanese film *Let Me Hear It Barefoot* by Riho Kudo. Then, in September 2024, he participated in the Philippine Queer Studies Conference with a poster presentation of his literary analysis of *The Love of a Certain Age* by Charlie Samuya Veric. Finally, he collaborated with fellow e-skolar Jana Denise Tomacruz for their research paper on the establishment of UP HERE at the International Conference on Open and Distance e-Learning (ICODEL) last February of this year.

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May we never cease to know, to learn, and to love more.

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Abstract

This exploratory sequential mixed-method study investigates disaster resilience through ICT-based management in Pamarawan Island, a coastal barangay in Malolos City. Despite the prevalence of disaster risk reduction and management (DRRM) research, disaster resilience in geographically isolated coastal communities remains underexplored. The study aimed to understand how residents perceive disasters, utilize strategies to enhance resilience, engage in DRR activities, and employ multimedia and ICT tools in disaster management. Anchored in social justice and resilience theories, data were collected through qualitative interviews and focus group discussions with 15 participants, followed by a quantitative survey of 50 residents. Findings reveal that multimedia tools like cellphones and televisions play a crucial role in disseminating information and encouraging participation in DRRM activities, although access and infrastructure limitations persist. The community perceives itself as resilient and relatively safe during disasters, yet geographic isolation, limited resources, power outages, and scarce emergency equipment constrain their capacity to fully implement DRRM protocols. The study underscores the need for tailored, ICT-enabled interventions, increased budget allocation, improved infrastructure, and inclusive policies that address the unique vulnerabilities of coastal barangays. This study contributes valuable insights into the intersection of disaster resilience, ICT management, and social justice in marginalized coastal settings.

Keywords: disaster risk reduction management; mixed methods; coastal disaster resilience; ICT-based management; and disaster justice

I. INTRODUCTION

Rationale

Pamarawan Island is one of the coastal areas in Malolos City, Bulacan, situated along the shorelines of Manila Bay, which is vulnerable to natural disasters due to its geographic location. With Manila Bay being one of the most significant fishery zones in the country, fishermen reside in these far-flung communities to sustain their livelihood. Currently, with ongoing reclamation projects and the construction of the New Manila International Airport in the nearby municipality of Bulacan, residents of Pamarawan foresee an impending wave of risks that will accompany this economic development. This situation resurfaces the community's struggles and poses new threats to their living conditions on the island. Furthermore, the presence of the aerotropolis contributes to the dwindling number of mangrove ecosystems, disrupting biodiversity. Reports have surfaced regarding illegal demolition of fish corrals and the unlawful detention of fisherfolk as the project progresses (AGHAM Diliman, 2022).

In relation to this, Pamarawan Island is projected to sink by 2050 due to the gradual rise in sea levels, along with other parts of Bulacan (Perez et al., 1999; Kulp & Strauss, 2019; Ines, 2023). This reclamation project adds to the community's growing fear of displacement and coercion to engage in coastal migration for better opportunities and living conditions elsewhere. Hence, for the residents of Pamarawan, it is not just a matter of being saved from floods but also from future challenges that may arise.

The growing interest in exploring the difficulties experienced by coastal communities in Malolos City, Bulacan, remains crucial for understanding how their living conditions can be improved through research and policymaking. In his study, Berse (2017) explored how the youth of Pamarawan perceive climate change and adapt to it while identifying available support. He noted a lack of household, community, and city-level actions aimed at minimizing climate change's detrimental impact on children, particularly regarding challenges faced on the island. Similar to how the community is susceptible to floods and power outages, educational activities in the barangay may be indefinitely halted to ensure everyone's safety. Thus, disaster-related events exacerbate educational isolation, driving residents to migrate or enroll their children in schools in urban areas (The Spearhead, 2024). Remarkably, Reyes et al. (2015) highlighted that public academic infrastructures in Malolos City remain vulnerable to risks caused by flooding, fire incidents, typhoons, and earthquakes. Furthermore, a study by Santos et al. (2020) produced the ISLET model—an economic framework aimed at pursuing disaster mitigation among Malolos City's far-flung communities. The ISLET model stands for infrastructure, social protection, local government intervention, education, and training related to disaster risk reduction measures. The significance of these studies shapes informed decision-making that can escalate into policymaking efforts focused on enhancing disaster resilience from localized viewpoints within coastal communities.

While numerous studies focus on life conditions on Pamarawan Island, opportunities exist to deepen knowledge and reawaken discussions surrounding disaster resilience contextualization. Echoing Recio et al. (2024), it is vital to acknowledge the importance of deepening disaster justice praxis by localizing

interventions related to Disaster Risk Reduction Management (DRRM) efforts and addressing capacities for advancing DRRM through research potentialities.

Therefore, this paper critically examines how residents perceive these disasters, engage in DRRM activities, and observe multimedia-based interventions' influence on reinforcing disaster resilience towards achieving disaster justice.

Statement of the Problem

Generally, the study aimed to resituate disaster resilience through ICT-based management in Pamarawan Island, Malolos City. The central problem focused on resurfacing the discourse surrounding disaster resilience in the community due to the scarcity of studies tackling this matter amidst Pamarawan Island being a known site for research studies. It explored how residents perceived disasters through a modern lens, particularly in contrast to other communities with greater resources and their own status as a geographically isolated barangay. Additionally, the study examined why the community, despite exposure to technologies, had not utilized these tools to enhance resilience during disasters. Specifically, this study sought to answer the following inquiries:

1. How do residents in Pamarawan perceive disasters, and what strategies enhance disaster resilience?
2. How do residents in Pamarawan engage in disaster risk reduction, and what is the role of multimedia in DRRM strategies for coastal communities?
3. Which ICT-for-DRRM practices are effective in the coastal community of Pamarawan, and how can they be replicated for improved disaster resilience?

Objectives of the Study

The following statements illustrate the necessary objectives within the study:

1. To explore place-based perceptions of disasters and strategies that enhance disaster resilience among residents of Pamarawan Island;
2. To culminate the residents' approaches in engaging with disaster risk reduction activities;
3. To identify the role of multimedia in DRRM initiatives on Pamarawan Island;
4. To enumerate the ICT-for-DRRM practices and its effectiveness in the coastal community of Pamarawan and explore their potential for replication to improve disaster resilience in similar contexts.

Significance of the Study

Remote coastal communities like Pamarawan Island in Malolos City are currently being studied to evaluate the crucial role that climate change plays in visualizing its worrying impact on the country. Remarkably, it is essential to acknowledge that Pamarawan is among the coastal towns most affected by the neighboring development of the New Manila International Airport. Pamarawan has always been a site of research addressing fishermen and their everyday lives among nearby coastal barangays, including Caliligawan, Namayan, Masile, and Babatnin.

Previous studies have addressed preparedness and resilience to disasters; however, these areas remain susceptible to flooding and power outages despite the growing body of knowledge acquired by researchers. The primary significance of this study is to understand how residents of Pamarawan perceive disasters, Disaster Risk Reduction Management (DRRM) strategies, and ICT-based interventions, and to

resituate the context of disaster resilience to achieve disaster justice in the coastal barangay.

The evaluation of ICT-based interventions subsequently required their perspectives before engaging in a collaborative pursuit of writing a policy brief. This policy brief will be presented to the authorities and considered for the upcoming facilitation of localized DRRM projects. Moreover, identified ICT-for-DRRM practices will be recommended and replicated for further exploration of localized perspectives in DRRM.

Scope and Limitations of the Study

The study focused on the coastal community of Pamarawan in Malolos City, identified as a barangay vulnerable to disasters. It aimed to understand disaster resilience and the role of ICT-based management in this geographic setting, particularly in addressing challenges linked to adjacent land reclamation and infrastructure developments. The research excluded neighboring coastal barangays to maintain focus on Pamarawan's unique context. Its findings were considered non-generalizable to other coastal communities or municipalities with differing socioeconomic profiles. Additionally, the study prioritized local perspectives and community-driven solutions over substantive elements of national disaster management policy.

II. REVIEW OF RELATED LITERATURE

This chapter encompasses previous studies that tackle Pamarawan Island as a known site of research studies, localized pursuit of disaster resilience and justice, and multimedia's role in the disaster risk reduction management activities. The scope of these studies culminates in a scarcity in diving deeper into how disaster resilience is perceived by residents through their own engagement in DRRM, how resilience can be interpreted in their respective households, and how they are capable of participating in decision-making units of action plans for the community. With all of this, the review offers a breadth of efforts to acknowledge and inform policymakers of the urgency to include coastal communities or barangays in their governing sessions and to enact plans of action to counteract risks for their overall safety as a community.

Several studies listed below exhibit the dominance of studies that introduce Pamarawan Island as an important host of the biodiversity surrounding Manila Bay and its cultural significance as a community of local fishermen endangered by nearby projects that pose risks that will influence the very problem of its residents: disasters. With these disasters, residents embrace their capacity to be resilient and continue their daily livelihood while drenched in floodwater and concerned with environmental degradation, given their geographical location.

Key studies from Ancheta et al. (2019) and Santos et al. (2020) presented the establishment of the ISLET model, which corresponds to the economic resilience for disaster mitigation. While its focus remains to lean on disasters, the matter of disaster resilience is set aside, and its sociopolitical significance tends to be ignored.

Regardless of their resilience as a far-flung community, aided by their adaptation to modernity, coastal migration still continues. Hence, the scarcity of the resources surrounding this matter amplifies the argument of the work of Rivera (2024), asserting that integration of localized knowledge in Philippine policies on disaster management must be exercised to truthfully cater to far-flung areas like Pamarawan, which tends to be incorporated in a compliance-oriented planning due to the lack of localized action plans cascading from the city proper. In general, the study in progress takes these studies into account in further reinforcing that disaster resilience is important to pinpoint, especially in underserved communities that live in far-flung coastal settings.

A. Pamarawan Island

Pamarawan Island has always been documented as a coastal barangay in Malolos City that is also adjacent to Manila Bay, as well as its identity as a far-flung community that is susceptible to natural disasters due to its geographic location. Along with other coastal areas around the north side of Manila Bay, its history with floods and sea level rise remains relevant to its residents' lived experiences. With most of the population relying on the fishery as their livelihood, another pursuit under the scorching heat and the heightening flood paints a misfortunate picture of their difficulties as a coastal barangay (Rodolfo et al., 2003; Bankoff, 2007).

Furthermore, Pamarawan Island is also identified as one of the internationally important waterbird sites along Manila Bay, underscoring the pressing concern for the conservation of the island and its biodiversity (Jensen, 2018). In his study, Fajardo (2022) expounded on the matter of marine cultural heritage through

observing Pamarawan Island. He asserted that Malolos City is more than just a place; it's a place where ecological fairness and cultural discourses collide, especially in light of the impacts of climate change and urbanization. Subsequently, the study acknowledged the alignment between the inhabitants' localized perspectives and the increasingly widespread global advocacy for environmental justice.

Ancheta et al. (2019) conducted their study at Pamarawan Island, which aimed to comprehend the ways in which locals view disruptions to their livelihood as disasters and how these affect their economic condition. According to the inhabitants in the study, a disaster is any disruption that prevents them from engaging in economic activity and forces them to adhere to the laws of nature. The study also discussed how the authorities failed to properly recognize that the existence of trash, water hyacinth, and the dumping of used oil gradually undermine the livelihood of fishermen, which is one of the many reasons they express being vulnerable. Later on, in a succeeding study, Santos et al. (2020) established the ISLET model as a product of their earlier work. Subsequently, Santos et al. (2020) constructed the ISLET model as a result of their previous work in a subsequent study. This study expanded on the previously discussed inquiry and recommended that the ISLET model be integrated to address issues such as food scarcity, contingent deficiencies, the incapacity of transitioning to another source of income, insufficient technology, and isolation from the mainland, which restricts their ability to interact with government organizations and other entities that could support the local economy.

With regards to the community's post-pandemic recovery, Valenzuela et al. (2022) determined that in relation to the community's post-pandemic recovery, individuals of various ages are keen on interacting and working together with those of different ages in order to support pandemic recovery and to express their needs and interests. The study also suggested fostering intergenerational understanding, coordinating social media platforms, facilitating educational discussions, working jointly across sectors and organizations in the future, and using intergenerational perspectives to pinpoint possibilities and obstacles associated with the pandemic. Through their work, the residents showed how resilient they are as a community and how willing they are to work together to create meaning and flourish despite their differences.

On the other hand, Pelayo et al. (2020) documented the disappearing notion of cultural heritage in Namayan, a neighboring coastal barangay in Pamarawan. They asserted that, in order to mitigate the adverse consequences of urbanization, women fishermen's oral histories needed to be recorded and conserved. This is in line with recommendations from other studies that highlight the necessity of sustainable development techniques that incorporate the preservation of cultural heritage as a way to empower local communities.

B. Pursuing Disaster Resilience and Disaster Justice

Abenir et al. (2022) implemented their research in Pugad Island, Hagonoy, Bulacan, to determine the importance of community-based leadership in enhancing disaster resilience. They highlighted that in Pugad Island, community-based leaders played a crucial role in planning disaster risk reduction projects, pushing for the

rights of marginalized communities, and procuring funds for community-based projects. This study also emphasized how fair and long-lasting disaster risk reduction measures may emerge by including vulnerable populations in leadership positions. Furthermore, the study recognized that community-based leaders face a number of difficulties, including inadequate financing, poor development assistance, and isolation from decision-making structures. Consequentially, the interventions led by external actors do not fully capture the essence of their difficulties as a community.

On the other hand, Valenzuela (2021) stressed the significance of disaster risk governance in building community resilience, especially in the Philippines' coastal areas. He also recognized the urgent need for inclusive governance frameworks that factor in socioeconomic considerations, indigenous place-based knowledge, and environmental sustainability. Furthermore, it is imperative that disaster risk governance incorporate strategies for adapting to climate change in coastal areas. For instance, urban gardening is an example of a community-driven initiative that fosters local involvement and supports sustainable practices that boost resilience to disasters.

In the same vein, Rivera (2024) assessed the presence of including and integrating localized knowledge in Philippine policymaking concerning DRRM and climate change. She asserted that the scarcity of localized knowledge in existing policies arose as it is hindered at the forefront, not meeting the desired extent of inclusion to reflect their viewpoints in disaster governance. Moreover, she claimed that disaster justice is still difficult to gain due to the lack of localized knowledge integrated into relevant policies as well as in localized discourses within the sphere

of disaster management. The study inquired about whether policy discussions uphold inclusion or perpetuate exclusivity, as there is an apparent mismatch with how DRRM policies are applied in most areas of the country. While it is valid for the Philippines to acknowledge and adhere to global frameworks to safeguard DRRM strategies, the inability to integrate place-based knowledge only retracts the nation's objective of sustaining its disaster management. Hence, the marginalization of place-based knowledge in the nation's policymaking arm remains counterintuitive in overcoming risks and pulls the nation away from garnering disaster justice for the Filipino masses without the presence of cognitive justice. The study further suggested that subsequent examination of how policies are curated at specific extents of governance reflect place-based knowledge.

As the island barangay continues to become a site of studies, through the collaboration of the Province Government of Bulacan and Royal HaskoningDHV, Pamarawan Island became one of the pilot locations of the North Manila Bay Flood Protection Strategy. Their cooperation seeks to aid the flooding problem in the coastal areas of Bulacan, with government officials subsequently partaking in the discourse of assisting this strategy with devising more projects to alleviate the flooding in Bulacan (Province Government of Bulacan, 2022). In line with the objective of Royal HaskoningDHV (2022) to uplift the island's resilience towards flooding, this strategic plan aims to "identify sustainable, nature-based flood protection measures for the Northern Manila Bay coastal area and to recommend pilot locations for implementation of these measures." This strategy serves as the succeeding initiative after the Manila Bay Sustainable Development Masterplan. Within their report, Royal HaskoningDHV (2022) identified that the root causes of the

flooding, in the context of these coastal areas, are loss of natural ecosystems, sea-level rise due to climate change, storm surges, and land subsidence. Through stakeholder engagement, including crucial site visits across the region, a set of twenty potential nature-based solutions and soft measures has been developed to address these issues, emphasizing the importance of coordination among various ongoing developments in the region for effective implementation. With the abundance of data gathered from consultations and site visits, the strategic plan outlined priority locations, including Pamarawan, as short-term solutions for smaller communities near Manila Bay are also proposed to enhance immediate resilience against flooding. Also, the strategic plan acknowledged the occurring challenges, which include the scarcity of resources to immediately act upon the promising flood interventions. The pilot testing in Pamarawan will be emphasized by implementing reforestation of mangrove sites, sediment traps, green embankments, and enhanced breakwaters, along with the interventions taking the ongoing Department of Public Works and Highways dike and breakwaters project and San Miguel Corporation's devised mudflat restoration into consideration. The success of these nature-based interventions will be crucial in guaranteeing its capacity to be replicated in the other locations included in the strategic plan. Conversations still continue among the Malolos City and Hagonoy LGU, Royal Haskoning DHV, and San Miguel Corporation concerning the pre-implementation and pilot locations of the aforesaid strategy and nature-based solution. The stakeholders discussed the detailed engineering design for the pilot locations, which include Pamarawan (Pacesetter, 2024; Balbin, 2023).

C. ICT-based Management: Multimedia in DRRM

Multimedia has been an essential instrument that has been used to promote the exchange of knowledge, enable development, and foster better stakeholder communication. Alampay (2018) noted in their study that social media management plays an important part in DRRM. To maintain fair access on all platforms and stabilize its use, it is necessary to address challenges like the digital divide, the absence of a centralized directory, and misinformation. It was suggested in their study that LGU interventions such as creating capacity, incorporating local knowledge, standardizing communication protocols, and engaging the community be implemented. In her article, Pineda (2012) observed the collaboration between LGUs and academic institutions in ideating effective e-disaster systems. They defined that e-disaster systems make use of a variety of technical assets, such as social media platforms, mobile applications, and Geographic Information Systems (GIS), in order to improve community engagement and information delivery, and their integration into disaster management approaches, molded with the expertise of academia, can positively influence how real-time collection of data, community resilience, and coordination are maintained by all stakeholders.

Furthermore, multimedia is capable of conveying important information concerning risks, emergency preparedness approaches, and response procedures in the context of disaster risk reduction. Sejati et al. (2019) emphasized the need for compelling educational resources to enhance the comprehension of disaster risk principles, suggesting that interactive multimedia could assist in narrowing the knowledge divide between theory and practice. Moreover, the use of multimedia in

reinforcing disaster resilience necessitates the development of skills and behaviors to encompass an effective and practical response to disasters.

Additionally, Chen (2018) mentioned that multimedia is crucial in disaster information management systems, and approaches like machine learning and data mining can aid in disaster response. Specifically, there are potentialities in using evolving technologies like artificial intelligence (AI), geographic information systems (GIS), and machine learning to support comprehensive disaster information management, as it is time-sensitive to mitigate human and material risks by having emergency services cooperate in a fast and reliable manner in the context of disaster response and recovery.

On the other hand, Nahak (2021) examined the presence of media in influencing communication in Odisha, a state in India that is also susceptible to disasters. He claimed that the media has been essential in aiding the government's aim of fulfilling a zero-casualty scheme in the country. Furthermore, he highlighted that the intervention of the media in reinforcing disaster resilience is backed up by the consistency of media practitioners' dedication to producing comprehensible information during disasters, as well as to encourage a higher level of collaboration and strategic partnership between the state and the media in disseminating up-to-date information about disasters among the masses. By the same token, Muryani et al. (2018) assessed the efficacy of utilizing multimedia in DRR education to leverage the students' skills and comprehension when a disaster strikes. They observed that imparting knowledge about disaster principles through multimedia strengthened their comprehension of the origins, development, implications, and approaches to

mitigating multiple types of disasters, including tidal floods, landslides, volcanic eruptions, and floods. The alignment of multimedia integration in disaster education with the Sendai Framework for Disaster Risk Reduction provides more space to deepen linkages on disseminating existing, new, and alternative approaches to ensuring that the media is shaping a disaster-resilient society.

Theoretical Framework

Expounding on the matter of situating disaster resilience in a coastal area necessitates a sufficient theoretical underpinning to guide the researcher throughout the research process. With this, the study will be anchored in social justice theory and resilience theory to deepen the understanding of inequality that subsequently resurfaces in the resilient behavior of the residents. While there are a variety of modern interpretations, social justice theory is primarily defined as a sociopolitical and intellectual perspective that promotes equal access and rights for all members of society, insisting on equality in the distribution of capital, prospects, and privileges; a theory that encourages fulfillment through a just and equitable society (Sabbagh & Schmitt, 2016; Taylor & Francis, 2023). The use of social justice theory will be a critical accompaniment in uncovering the discourse that arose due to the injustice being experienced by the far-flung community of Pamarawan Island and in mitigating the risks that perpetuate this instance. On the other hand, resilience theory is centered on the qualities that foster healthier outcomes in the midst of challenging circumstances and enable individuals and whole communities to adjust, bounce back, and flourish in the face of disaster (Southwick et al., 2014).

Hypothesis

In contrast to conventional research, which aims to validate or disprove theories, participatory action research operates independently of the hypothesis testing framework. It emphasizes using group inquiry and action to comprehend and resolve real-world situations. Hence, the central objective is to come up with a policy brief that could bring about social change (Bergold & Thomas, 2012).

If the circumstances necessitate it, the study will test these hypotheses:

1. Residents of Pamarawan Island perceive flooding and climate-related disasters as significant threats to their community, and they employ specific strategies to enhance their disaster resilience.
2. The awareness and use of multimedia tools in disaster risk management methods has a strong relationship with the participation of Pamarawan residents in disaster risk reduction (DRR) activities.
3. Residents of Pamarawan Island are far more probable to participate in disaster risk reduction management (DRRM) programs when multimedia interventions are used.

III. METHODOLOGY

Research Design

The study utilized exploratory sequential mixed methods to have thorough information on the community's perceptions, behaviors, and best practices in reinforcing disaster resilience in a flood-prone barangay like Pamarawan. The use of mixed methods research is crucial in providing extensive answers to the situated inquiries in the study, in which both qualitative and quantitative data analysis will intertwine to encompass a thorough exploration of the problem. Creswell and Creswell (2018) expressed in their book that mixed methods research, in design, is quite relevant because of its interdisciplinary capacity to answer complex research questions rather than using either of the two methods on their own. In this study, the research problem is rooted in environmental science and disaster management, but it can still be grasped that the involvement of other disciplines like multimedia and ICT can further explore, as well as visualize disaster resilience with modernity in mind.

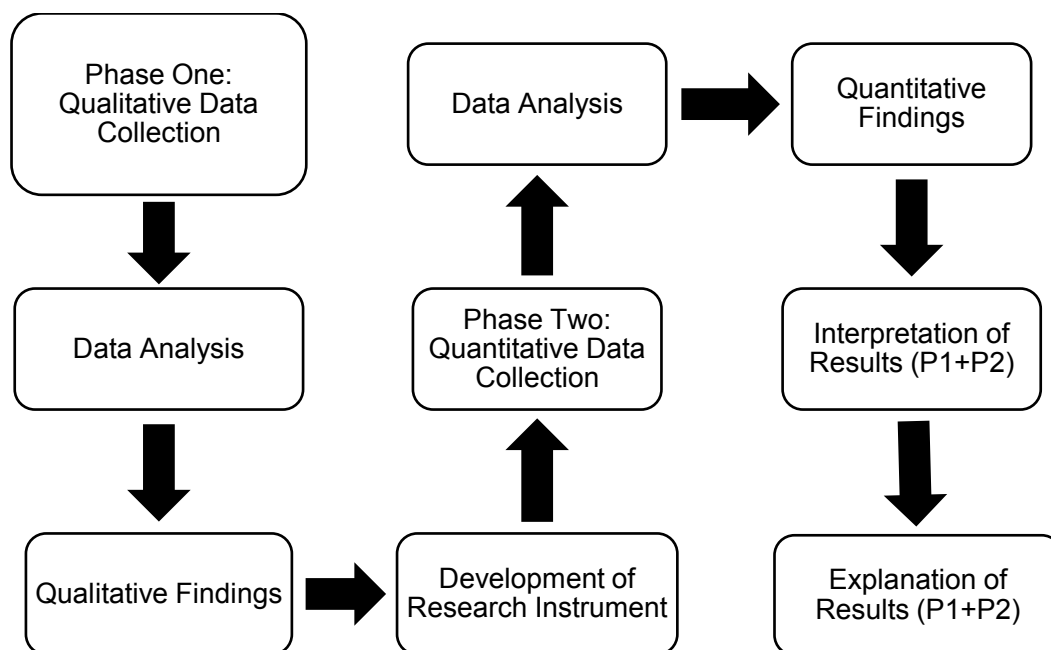


Figure 1: Exploratory Sequential Mixed-Method Research Design

Scope and Limitations of the Study

The City Government of Malolos City Disaster Risk Reduction and Management Office (2022) identified Pamarawan as one of the coastal communities situated along the shorelines of Manila Bay that is vulnerable to disasters such as storm surges, tsunamis, and earthquakes. Furthermore, these coastal communities are affected by nearby land reclamations and infrastructure projects like the New Manila International Airport. Hence, the study sought to critically resituate the matter of disaster resilience with ICT-based management in the aforesaid community, as its geographic vulnerability strikes at the forefront among all the neighboring coastal barangays.

Respondents of the Study

For the qualitative phase of the study, the researcher conducted one-on-one interviews with four (4) participants from each district (Balot, Wawa, Gitna and Hulo) to foretell their respective livelihood in Pamarawan, a coastal area acknowledged for being susceptible to a variety of natural disasters, such as typhoons and floods. Then, eleven (11) participants, were invited for focus group discussion. The responses that were obtained from these participants were used in developing the research instrument for the second phase of data collection, which was the survey questionnaire. Consecutively, the quantitative phase was commenced through collecting survey responses from fifty (50) participants to closely link with the qualitative findings. Furthermore, the study intended to contribute to wider conversations on disaster management in the Philippines, a country that faces many difficulties because of its geographic and socioeconomic environment, by emphasizing local perspectives. This localized perception is essential for improving

community-based disaster risk reduction activities and steering policy recommendations, particularly for remote communities that do not receive the expected volume of assistance due to their location.

Sampling Method

The selection of participants was determined by the use of purposeful sampling, ensuring that they have relevant knowledge regarding disaster resilience in addition to being familiar with the local circumstances. In line with the work of Teddlie and Yu (2007), a broader category of the aforementioned sampling is sequential purposive sampling, which accompanies the intent to generate a theory or develop an instrument, and the participants are intendedly chosen due to their significance in answering the research questions. While the study primarily pinpoints the central theme within the island-barangay residents' involvement, participants must be permanently residing in Pamarawan and be at least eighteen (18) years old to be eligible for data collection, ensuring that they have the maturity and life expertise to articulate their experiences and viewpoints about their practices before, during, and after a disaster. With this sampling method, the total number of participants that was asked and informed about this study is sixty-five (65) residents of Pamarawan Island: four participants for one-on-one interviews, eleven participants for a focus group discussion, and fifty participants for surveys.

Data Gathering Procedure

The first phase of the data gathering procedure leaned on collecting qualitative data, in which the researcher will visit the research site, identify the participants, and secure written informed consent forms. The researcher explained

the objective and disclosed important details of the study to underscore transparency on how the data will be used later on. A semi-structured interview guide was used in administering both one-on-one interviews and focus group discussions. The use of open-ended questions will enable additional questions to seek clarity on narratives within their insights. The first phase was accompanied by sound recording equipment to document the participants' insights and notes (e.g., transcript) to aid the interpretation of qualitative findings. Before commencing the data collection, the researcher sought the insights of the barangay council concerning the attitudes of the residents when it comes to researcher-resident interactions as the island-barangay is a frequent site for researchers. Along with the barangay council's acknowledgement through the certificate of appearance, the key researcher went to the four districts of the barangay to interview one participant for each district. The researcher allowed the participants to practice their right to not disclose or answer any interview question and respect decisions if they decide not to push through at any point of the interview. The researcher briefly explained the content of the informed consent form, the background of the study, and entertained the interviewees' questions. Data gathered from the qualitative phase were interpreted, and the insights were linked with the quantitative results and were subsequently used to develop the research instrument for the second data collection phase.

Correspondingly, the development of the research instrument, a structured survey questionnaire, integrated questions from the American Planning Association's 2019 Disaster Recovery Guidance: Qualitative Interview Report. Regardless, the survey questionnaire was reviewed by the researcher and the adviser to ensure that the questionnaire is locally aligned to the research problem. Hence, emerging

themes from the interviews and focus group discussion will be taken into consideration. After a thorough review of the questionnaire, the second phase of data collection commenced. The researcher, with the help of local authorities, identified the selection of fifty participants for this qualitative data gathering process by coinciding the survey distribution with their quarterly barangay assembly. Afterwards, the researcher administered both written informed consent forms and survey questionnaires among the fifty participants. Finally, all data were consolidated for interpretation and explanation of the findings from both data gathering phases.

Research Instrument

For the qualitative phase, a semi-structured interview guide was developed through the integration of the study's questions and localized adaptation of the American Planning Association's 2019 Disaster Recovery Guidance: Qualitative Interview Report to cater to the place-based knowledge that must be gathered to fulfill the exploration of the subject matter. Once the interview guide is devised, it will be used for both one-on-one interviews and focus group discussions (FGD). On the other hand, the formulation of the research instrument for the quantitative phase, a structured survey questionnaire, was embedded with the insights garnered from the qualitative phase. The structured survey questionnaire was also reviewed by the research adviser before commencing its dissemination to the participants. The key researcher used local terminologies for the five-point Likert-scale questions in consideration of the residents' proficiency, as oriented by the barangay council. The key researcher used the sequence of words for the Likert-scale questions: Hindi, bihira, patas, minsan, lagi (never, rarely, sometimes, often, always)

Data Analysis

The first phase underscored the nominal data that will be collected through one-on-one interviews and focus group discussion. The initial version of the semi-structured questionnaire consisted of questions rooted in the study's questions and the referential interview guide from the American Planning Association. Data collected by the researcher were consecutively transcribed before the facilitation of identifying themes, narratives, and insights. The collected data were important in both the development of the research instrument and the interpretation of consolidated findings. Then, the researcher formulated the survey questionnaire with the five-point Likert rating scale in mind. The researcher collected responses from fifty participants before consolidating findings from both qualitative and quantitative findings.

To overcome thematic saturation, the key researcher decided to wrap up the one-on-one interviews by only having one interviewee per district (purok) to ensure that their experiences will yield different insights surrounding their resilience towards disasters. Initially, the researcher eyed to aim five participants for the one-on-one interviews. Since the researcher thought that the data gathered from the four participants were enough to represent initial insights, the one-on-one interviews immediately wrapped up and the focus group discussion consisting of 11 residents commenced.

For measuring the reliability of the scale within the quantitative instrument, Cronbach's alpha is utilized through the use of statistical software Jamovi. This will aid the researcher to ensure if the scale is reliable within the 5-point Likert item

questionnaire with 15 items, run on a sample size of 50 residents of the barangay. Due to the small sample size (n=50), the researcher couldn't proceed with construct validity testing like confirmatory factor analysis. Hence, the researcher pursued preliminary reliability testing and content validity due to these limitations.

Ethical Consideration

In accordance with ethical guidelines like TCPS 2: CORE-2022, the researcher complied with necessary steps to ensure that the study will be ethically and fairly conducted in pursuit of carefully garnering knowledge from participants. Sequentially, the researcher provided particular information concerning the intentional usage of data to garner their broad consent, especially in the case of utilizing data for future studies. Furthermore, the researcher upheld the anonymity of the participants' identities, especially in the qualitative phase, to honor the confidentiality of information that is easily identifiable. Along with this, it was the researcher's top priority to continuously treat all participants with respect throughout the study, from start to finish. Finally, the researcher also acknowledged a conflict of interest in which he resided in the island barangay before attaining education, which resulted in relocation and detachment from the island barangay community. Then, the researcher no longer had any recent visits in the island-barangay, only garnering knowledge that came from accessible studies and news articles on the Internet. Hence, the researcher's place-based knowledge concerning the island-barangay's resilience is also nonexistent.

IV. RESULTS AND DISCUSSION

Socio-demographic Profile of Respondents

Table 1. Study Demographics

Qualitative Phase: Interviews and Focus Group Discussion			
Demographic Profile	Description (Valid)	Frequency	Percentage
Sex	Female	13	87%
	Male	2	13%
	Total	15	100%
District (Purok)	Balot (IV)	7	47%
	Wawa (III)	6	40%
	Gitna (II)	1	6.5%
	Hulo (I)	1	6.5%
	Total	15	100%
Quantitative Phase: Survey			
Demographic Profile	Description (Valid)	Frequency	Percentage
Age	20-29 years old	3	6%
	30-39 years old	4	8%
	40-49 years old	10	20%
	50-59 years old	19	38%
	60-69 years old	12	24%
	70 and above	2	4%
	Total	50	100%
	Balot (IV)	20	20%
	Wawa (III)	13	13%

District (Purok)	Gitna (II)	14	14%
	Hulo (I)	3	3%
	Total	50	100%

In line with the research design, the conduct of the qualitative data collection took place before the quantitative data collection via survey. The qualitative phase was represented by two parts: one-on-one interviews and focus group discussions. The one-on-one interviews were prioritized to be equally distributed to each district, with one participant per district.

For the quantitative phase, 50 survey questionnaires were deemed valid from 61 responses gathered by the key researcher. The researcher conducted the survey distribution during the quarterly general assembly of the barangay Pamarawan on April 5, 2025. The majority of respondents in the sample come from the district of Balot, accounting for 44% of the total population surveyed. Balot is the nearest district wherein the barangay hall, covered court, hospital, and schools were situated. This is followed by Gitna with 28%, Wawa with 26%, and Hulo with the smallest representation at 8%. This distribution indicates that Balot is the most prominent district in the dataset, which may reflect population density, accessibility, or sampling focus in that area.

When examining age groups, the 50–59 bracket emerges as the largest segment, representing 38% of the respondents. This suggests a significant portion of the population is in their middle to late working years, potentially indicating a mature

workforce or community base. In contrast, younger age groups, specifically those aged 20 to 39, are underrepresented, comprising only 14% of the sample.

Most respondents came from Balot due to how nearby the location for the barangay assembly is, which also explains the very limited representation of Hulo, which is the farthest district. Across all districts, there is a clear concentration of older adults aged 50 and above. This trend suggests an aging population profile within the sample, which could have important implications for community planning and resource allocation. The predominance of older adults may indicate longer life expectancy, lower birth rates, or youth outmigration in these districts. Overall, this socio-demographic profile highlights a predominantly older population with a strong representation from Balot. The consistent pattern of older age groups across all districts underscores the need for targeted community programs, healthcare services, and policy initiatives that address the specific needs of an aging population. Understanding this demographic structure is crucial for effective planning and ensuring that services are aligned with the population's age-related demands.

Creation of the Survey Questionnaire

Table 2. Research Question Comparison

Thematic Construct	Research Question	QUAL (Interview Guide)	QUAN (Likert-scale Survey)
Perception and Strategic Inquiry (PSI)	RQ1. How do residents in Pamarawan perceive disasters, and what strategies enhance disaster resilience?	How do you perceive disasters in your barangay? What do you do to be resilient against frequent disasters?	5. In times of disaster, I consider the strength of the cell signal/tower. 6. In times of disaster, I consider my faith. 10. In times of disaster, I stay at home when evacuation is ordered. 12. In times of disaster, I have experienced meetings about disasters. 14. In times of disaster, the community of Pamarawan is considered resilient.

			15. In times of disaster, Pamarawan is considered safe.
DRR & Multimedia Inquiry (DRR-MI)	RQ2. How do residents in Pamarawan engage in disaster risk reduction, and what is the role of multimedia in DRRM strategies for coastal communities?	<p>What difficulties does your community have to overcome in order to put disaster risk reduction measures into practice?</p> <p>Which multimedia tools—such as social media, mobile apps, films, and community radio—are being used in your community to lessen the risk of disasters?</p> <p>Can you share instances of the dissemination of critical information during disasters using social</p>	<p>1. In times of disaster, I need help from the barangay.</p> <p>2. In times of disaster, I need help from fellow residents.</p> <p>4. In times of disaster, I get news from my cellphone.</p> <p>7. In times of disaster, we need to evacuate away from our home.</p> <p>8. In times of disaster, people leave the island to evacuate to the town.</p> <p>9. In times of disaster, I stay at home when evacuation is ordered.</p>

		media or other digital platforms?	
ICT-for-DRRM and Replication Inquiry (ICT4DRRM-RI)	RQ3. Which ICT-for-DRRM practices are effective in the coastal community of Pamarawan, and how can they be replicated for improved disaster resilience?	Are there any effective ICT practices in your community that you think other communities could adopt? Which ones, if any, and why? If we attempted to duplicate effective ICT practices from different areas in Pamarawan, what difficulties do you think may occur?	4. In times of disaster, I get news from my cellphone. 11. In times of disaster, I watch TV for important news. 13. In times of disaster, multimedia (cellphone and TV) is considered important.

Table 5 provides the joint comparison of how the study’s research questions were encompassed in both qualitative and quantitative data procedures of the mixed-methods study. For instance, research question #1, which focuses on the perception of disasters and disaster resilience strategies, was presented by two direct questions towards the matter and subsequently asked as part of the interview guide, whereas the quantitative phase involved six questions that widely gathered the insights of the survey respondents: Do the residents consider their faith, their

reluctance or adherence to evacuate, participation towards DRRM-related meetings, among other factors that were introduced in the participants' interviews?

Then, research question #2 involved discussion of the residents' engagement in DRR and the role of multimedia in their livelihood as a coastal barangay. The participants were asked about the difficulties that they experience in pursuing DRR measures and how they would face them. Furthermore, they were asked to give examples of multimedia tools that they use on the island and how they aid them in scenarios that involve disasters: Do the residents browse information on their cellphones when there's a disaster, seek help from the barangay council and fellow residents, evacuate away from their homes, ride a boat to the city proper, or ignore the evacuation advice?

Lastly, research question #3 sought to acknowledge the residents' use of ICT towards making their households safe and resilient towards disasters and how replication could also benefit other coastal barangays like the neighboring coastal areas in the city of Malolos. The qualitative phase highlighted insights that link coastal areas with one another to avoid incidents and casualties when disaster strikes.

Face Validity

Due to limitations concerning time and resources, the researcher sought the expertise of the research adviser to offer comments and recommendations concerning the improvement of the survey tool in terms of clarity, grammar, sentence construction, document format, and totality. Necessary revisions were fulfilled by the

researcher before disseminating the final version of the survey tool to the fifty respondents in Barangay Pamarawan.

Content Validity

The researcher constituted validity of the research through the guidance of the research adviser, who also checked upon the given interview transcripts and drafts of the survey tool. The survey instrument was written in two languages: English and Filipino. For better dissemination and comprehensible dialogue, the researcher decided to use the questionnaire written in Filipino to minimize confusion concerning the research inquiries when answered by the residents of Pamarawan. The research questions were closely adapted from the key researcher's gathered themes during the qualitative phase of the study.

Reliability

Table 3. Scale Reliability Test Results

	Mean	Standard Deviation	Cronbach's α	Internal Reliability	Number of Items
scale	4.30	0.573	0.949	Excellent	15

When assessed on Jamovi, the Cronbach's alpha of 0.949 indicates outstanding internal consistency or reliability. This indicates that there is a strong correlation between the 15 items in the 5-point Likert-scale survey questionnaire, and they most likely measure the same underlying construct consistently. Although this raises questions about possible redundancies, this conclusion might also make

more sense when the survey findings are presented in the Results section, which leads to a response to the study's main theme.

Table 4. Survey Findings

Question	Never (Hindi)	Rarely (Bihira)	Sometimes (Patas)	Often (Minsan)	Always (Lagi)	Mean	Result
<i>In times of disaster...</i>							
I need help from the barangay.	1 (2%)	1 (2%)	2 (4%)	21 (42%)	25 (50%)	4.3	Always
I need help from fellow residents.	0 (0%)	1 (2%)	0 (0%)	41 (82%)	8 (16%)	4.2	Often
Our household is saving food and supplies.	0 (0%)	1 (2%)	3 (6%)	9 (18%)	37 (74%)	4.64	Always
I/we get news from the cellphone.	0 (0%)	1 (2%)	2 (4%)	12 (24%)	35 (70%)	4.66	Always
I consider the strength of the cell signal/tower.	0 (0%)	4 (8%)	3 (6%)	13 (26%)	28 (56%)	4.48	Always
I consider my faith.	2 (4%)	0 (0%)	0 (0%)	7 (14%)	41 (82%)	4.72	Always
We need to evacuate away from our home.	13 (26%)	6 (12%)	2 (4%)	23 (46%)	6 (12%)	3.2	Often

I/we follow announcements from the barangay.	4 (8%)	1 (2%)	0 (0%)	10 (20%)	35 (70%)	4.54	Always
I/we leave the island to evacuate to the city proper.	13 (26%)	10 (20%)	1 (2%)	22 (44%)	4 (8%)	3.1	Often
I/we stay at home when evacuation is ordered.	13 (26%)	2 (4%)	0 (0%)	23 (46%)	12 (24%)	3.48	Often
I/we watch TV for important news.	2 (4%)	1 (2%)	0 (0%)	6 (12%)	41 (82%)	4.68	Always
I have experienced meetings about disasters.	1 (2%)	1 (2%)	0 (0%)	26 (46%)	23 (24%)	4.4	Often
Multimedia (cellphone and TV) is considered important.	0 (0%)	1 (2%)	4 (8%)	11 (22%)	34 (68%)	4.64	Always
The community of Pamarawan is considered resilient.	0 (0%)	0 (0%)	1 (2%)	4 (8%)	45 (90%)	4.94	Always

Pamarawan is	1	0	3	12	33	4.64	Always
considered safe	(2%)	(0%)	(6%)	(24%)	(66%)		
during disasters.							

Table 6 presents the survey findings during the quantitative data collection of the study at the Barangay Hall of Pamarawan. Initially, the researcher garnered more than the estimated 50 respondents needed, amounting to a total of 61 responses. Upon checking, the researcher discarded the 11 responses due to their invalidity, which could be attributed to not specifying their districts, age, signature for the informed consent form, and incomplete checkmarks for the survey questions. Regardless, the researcher still obtained the target number of 50 responses to pursue the quantitative analysis.

Within the findings, these are the following insights that were obtained from the 50 respondents. Starting with the first question, 50% of respondents indicated that they always need help from the barangay, highlighting a strong and consistent reliance on barangay support among the majority. Then, it was expressed that their households consistently save food and supplies, with 74% of them responding "Always." While Pamarawan is still considered a coastal area with ongoing development towards the use of technology, 70% of the respondents get news from their cellphones in times of disaster, showing their adaptability to modernity amid the barangay's geographic location and limitation to network and Internet access. To the majority of them, amounting to 56%, they always take the strength of the cell signal/tower into account, as communication among coastal governance actors and families that communicate with each other when faced with disasters like typhoons.

Most respondents consistently consider their faith important, with 82% always doing so and only 4% never. When it comes to evacuation, nearly half (46%) often feel the need to leave their homes, while a significant minority (26%) never consider evacuating. Following barangay announcements is highly prioritized, as 70% always pay attention to them, contrasted by 8% who never do. Leaving the island to evacuate to the town is less common, with 44% often doing so but 26% never taking this step; this also sparks less visibility of coastal emigration. Similarly, staying at home during evacuation orders is chosen often by 46%, though 26% never stay put, showcasing their trust in the resilience of their households and their familiarity with disasters. Watching TV for important news is a widespread practice among the residents of Pamarawan, with 82% always tuning in and only 4% never bothering to watch informative news. Participation in DRR-related meetings is somewhat divided, as 46% often attend while 2% never have. The location of the barangay hall might have contributed to this, as there are four districts (purok) in Pamarawan. Multimedia sources like cellphones and TV are regarded as important by 68% of the respondents who answered "Always," with no respondents indicating they never consider them important. The community of Pamarawan is overwhelmingly viewed as resilient, with 90% always seeing it this way and none rejecting this view. Lastly, most respondents feel safe during disasters, with 66% always feeling secure and only 2% never feeling safe.

Table 5. Disaster resilience themes from qualitative data collection

Themes	Characteristics	Highlighted Quotes
Physical aspect	Concrete houses and stable roofs	<p>“[...] is in a relatively stable place, that first the houses are made out of concrete, then the roofs are also strong, so it's not that it becomes too dangerous to prepare for the typhoon (participant 1).”</p> <p>“What is really needed is a solid concrete wall that surrounds Pamarawan so that the waves and floodwater will not pass through (participant 1).”</p>
	Remodeling and strengthening infrastructure	<p>“If possible that you can build a house, make it durable (participant 7, FGD).”</p>
	Partnership-based infrastructure projects	<p>“Our long-term project is to surround the entire barangay with a wall, which has a gate that is closed when the tide is high and opened when the tide</p>

		is low [...] that's the project with the Netherlands (participant 1)."
Economic aspect	Disruption of livelihood	<p>"[If there's a disaster] how can we get more stock? How can we sell [products at the store]? (participant 2)"</p> <p>"During summer, we have our livelihood. Today, there is no flood, then we don't have [difficulty]. We are like ants, even before the disaster approaches, we save our food. You must have money in that time period. That time will take a month or two months. You won't be able to go to the sea for two months, you won't be able to work for two months (participant 4)."</p>
Social aspect	<p>Marites (gossiping)</p> <p>Elders' knowledge</p>	<p>"In the city proper, they are using cellphones, right? In here, it's only Marites (participant 7, FGD)."</p> <p>"This is what is happening to us, especially when there is no longer--- that brownout (power outage), there</p>

Faith

is no communication, it's only the elders who will say that the weather will be like that later [...] They even know it from a gust of the wind, they know what will happen (participant 9, FGD).”

“Prayer, prayer. In preparing for [disasters], it looks like what you said, when the flood comes, it is necessary to raise equipment. It's understandable because when there's a disaster, people are on alert. When we have something coming, they will prepare (participant 8, FGD).”

“As for the earthquake, the earthquake you really have nowhere to run but maybe our faith in God and the belief that there won't be a tsunami here among us (participant 1).”

Institutional aspect Early warning system

“For example, if there is a typhoon signal, signal #1, #2 or #3, we surround those on the coast where

DRRM equipment	<p>we tell them that the typhoon is coming, the typhoon may make landfall at twelve o'clock in the evening, so we are evacuating you here to our evacuation centers such as the school and our second-storey building (participant 1).”</p>
Coordination with city government	<p>“So almost every house has solar lights, flashlights ready, especially our barangay tanods. In order to have equipment so that even if they have a brownout they can walk, they have boots, they have raincoats, it seems that our barangay in Pamarawan is able to comply with what is needed for everyone to move properly (participant 1).”</p>
Coastal governance relations	<p>“Charging phones through solar panels [...] so that's where we take for communication that doesn't get interrupted even if there's a brownout, charging their [mobile] phones. So, through this communication, [public] service is still</p>

continuous, even at the city hall and then here in the barangay even without electricity (participant 1).”

“Because I also see, the same is true in the neighboring barangays in other coastal areas—Caliligawan, Namayan, Masile, Babatnin [that] the practice is the same. When there is a typhoon, it also surrounds [the coastal areas], because we monitor [it] when other coastal barangays are in contact with us. When our electricity goes out, we will call the other barangay where that pole fell, where that is [...] We know that here in the other barangay, they are doing the same. They also evacuate people, they also encourage. Also stay in higher places because just in case the water rises a lot, those in low places will be hit first. So, I think it won't be difficult to convince people, especially those [who live] here in

Authority to cancel
classes

Scarcity of firemen

Latian, in the coastal area (participant 1).”

“So, in that case, when there is a typhoon, mainly the young students in school, the city or the provincial [government] has not yet canceled the classes, so we are the first to cancel. Then, the barangay council, had already canceled because the situation in barangay Pamarawan is different from the barangays in the city proper. So, we have to cancel the class even earlier (participant 1).”

“For example, if there is a fire in this area, where do you go? So, what's the matter, the people here are all aware, especially of the fire problem, there really are almost no firefighters here, so it's a bit scary but because of the cooperation of the people, the fire that threatened [the neighborhood] was easily extinguished (participant 1).”

Ecological aspect	Mangrove planting	<p>“And we also have a plan [...] in front of Barangay Pamarawan, there will be more mangroves to have more sediments to withstand waves. This will be a long-term project because mangrove takes 5-10 years to reach desirable growth (participant 1).”</p>
	Waste reduction	<p>“The thing I want to extend here is mangrove planting because that’s number one (participant 4).”</p> <p>“Proper disposal of waste [...] what happens with our waste is it’s not only Pamarawan but the coastal areas up to Manila, or even other parts of the Philippines, they dispose of waste in the ocean (participant 4).”</p>

Source: Qualitative data findings, March 28-29, 2025

Discussion

Perceptions towards Disasters & Disaster Resilience Strategies

Resonating with the point of Rivera (2024), the study critically attempts to emphasize and resurface the discourse surrounding disaster resilience with the aid of place-based knowledge of the residents, in contrast to the primarily science-based and technical strategies to enforce set national and local goals among respective

communities. Hence, anchored to this inquiry, the first research question focused on how the coastal community of Pamaraweños views disasters in their contexts and what strategies they employ to enhance disaster resilience, whether in their respective households or as a whole barangay.

Una, sa mga sakunang dumarating dito, pang-karaniwan na yung bagyo sa panahon ng tag-ulan na dumarating siya sa buwan ng July hanggang October, o November ganoon, yung mga kalamidad na dumarating na ganoon ay pinaghahandaan, lalo na ng Sangguniang Barangay saka ng mga tao. Kung halimbawang mayroong signal ang bagyo, signal #1, #2 or #3 ay iniikutan namin ‘yung mga nasa baybayin na kung saan ay sinasabihan namin na padating na ang bagyo (First, of the disasters that come here, it is common for the typhoon during the rainy season that it comes in the months of July to October, or November like that, the calamities that come like that are prepared, especially by the Sangguniang Barangay and also by the people. For example, if there is a typhoon signal, signal #1, #2 or #3, we check on those on the coast where we tell them that the typhoon is coming).

(Participant 1, Interview 1).

In Barangay Pamarawan, disasters are not considered as something new, and the abundance and lack thereof may also imply several things to their daily livelihood. Alongside the prominent news that Filipinos could acquire from the television, Pamarawenos’ knowledge of disaster preparedness comes with their familiarity with when the disasters will eventually strike, since the island’s geographic location makes them extremely vulnerable to floods. Participant 1 foretold how

preparing for disasters in Barangay Pamarawan is ingrained in the community's daily living. The participant's statement concerning perception towards disasters lies more on how residents retain their experience in the island barangay. With its area of about 264 hectares, the coastal island can only be built with limited houses, with some families bravely situating their homes near the coast. And with the directive of the barangay council, the families near the coast are those who are informed first due to their exposure to imminent risks and dangers. Participant 1 also pinpointed that students are also one of the priorities of the barangay council, reiterating that there is clear communication between the educators and the barangay council.

Hindi ba'y dumadating naman sa atin ay 'yung halimbawa 'yung bagyo. Hindi ba may announcement naman? Saka nararamdaman naman natin, malakas ang hangin, maano. (Isn't the typhoon that comes to us for example. Isn't there an announcement? Then we feel, the wind is strong, what is it?).

(Participant 2, Interview 2).

Participant 2 also exhibited the same attitude with disasters, perceiving them with normalcy and knowingly enduring their impact on their livelihood. In the coastal community, they also tend to depend on their preparedness with the elderly community's advice on what to do and what to look out for when disasters strike the island barangay. Most residents would also seek their views, along with weather forecasts that can be garnered through the television or cell phones. In the survey findings, the residents expressed that they always follow announcements from the barangay (70%) and get news from their cellphones (70%) and televisions (82%).

Mahirap [...] Yung katulad ng paninidahan ko. Pag lubog, di kami makadaan ng e-trike, kanya-kanya kaming daungan [pagdaong]. Paano kami makakatub pa? Paano kami makakapanindahan? (Difficult [...] Like my business as a storeowner. When we are flooded, we cannot pass by e-trike, we have to reach the port by our own [docking].) (Participant 3, Interview 3).

Participant 3 focuses more on the economic aspect when asked about her perceptions concerning disasters, pinpointing how the flood affects the continuity of her business, which is a store that she regularly stocks with newly bought goods from the city proper. She expressed that the floodwater affects how her business operates due to the difficulty of delivering the goods from the harbor to her household before arranging it to her store. Just like other storeowners, Participant 3 suffers the same fate of being resilient for the purpose of making income that will sustain her family's needs amidst the presence of disasters. Participant 3 resonates with those who prefer to settle elsewhere when the floodwater is unbearable, as she has her relatives in the city proper, with 44% of the survey respondents expressing their preference towards evacuating to the city proper rather than staying in Pamarawan.

'Yung sakuna rito ano kasi panahon ng Mayo hanggang Agosto. Yun talaga ang ano—kahit sa mga ninuno natin, at mga ninuno nila. E dinanas din nila yun, bago tayo sila muna. Alam nila yung hanggang sa magsama-sama lahat. Sa sakuna, patindi ng patindi ang pagtaas ng tubig, nagbabago ang klima. Iyon ang nakikita ko sa klima [o] panahon sa atin, siguro climate change na rin.

(The disaster here is from May to August. That's what it really is—at least for our ancestors, and their ancestors. And they suffered that too, before us. They know that until everyone gets together. In the disaster, the water rises more and more, the climate changes. That's what I see in our climate [or] weather, maybe it's climate change.) (Participant 4, Interview 4)

Then, Participant 4 cited that disasters have always been a companion of the community, even with the ancestors that came before them, but also mentioned the matter of climate change when asked about his perceptions. In a similar vein, climate change's impact surrounds Pamarawan in a more dangerous situation, as it is projected to be one of the communities in Bulacan and across the globe to sink by 2050 due to how rapidly sea level rises every year. (Perez et al., 1999; Kulp & Strauss, 2019; Ines, 2023). This comes out as an urgent concern for residents who would eventually consider coastal emigration or leaving the island barangay to live elsewhere; in this instance, most residents would prefer to settle in the city proper. Other residents who already have their relatives in the city proper will consider this an easy route, while fisherfolk who live their lives by the sea will find this very difficult to detach from the settings that they grew up in and may not see any prospects in the city proper. From the survey findings, 44% of the residents answered that they would consider evacuating to the city proper to ensure full safety when disasters strike, yet 46% of them also answered that they would rather stay at home when evacuation is ordered. The theme of resilience shines in this divisive outcome of their perceptions, while other residents find solace and comfort with what they have in hand, and others would also ensure that they wake up unscathed from any dangers that the disasters could bring forth to their families. For some, these struggles tend to

toughen them and become a part of their lifestyle that they would like to savor every day. For Participant 1, there is a contentment in living the way they have coexisted with disaster, along with the fisherfolk. For him, there has always been the feeling of enrichment in pursuit of the development of the barangay's conditions.

Dito naman kasi bago pa naman lumalim talaga yung tubig na sinasabing baha, handa na tao, itinaatas na yung mga bangka, yung mga gamit na medyo maanod, pinapatong na doon sa medyo mataas na parte ng bahay. Kaya naman pag ganon talagang nandyan na yung baha, hindi naman nakakatakot kasi baha dito sa Pamarawan dahil halos tatlong oras lang, wala na ubos na kaagad siya. Ang nakakatakot lang dito yung alon dito sa dagat nanggaling. (This is because before the water that is said to become floodwater gets really deep, the people are ready, the boats are being garaged, the things that are a little drifting, they are being placed there on the relatively high part of the house. That's why when the flood is really there, it's not scary because the flood here in Pamarawan because it's only about three hours, it's gone immediately. The only scary thing here is the waves from the sea.) (Participant 5, FGD)

During the focus group discussion, the participants expressed that the community itself already has the collective sense of urgency to prepare for disasters, evoking immediate preparation for what's to come and overcoming fear and confusion among households. They have also cited the rapid occurrence of floods that come and go, attributing to how they see it as a normal thing to happen but fear the waves coming from the sea due to their bold impact on the infrastructures.

Sa'kin po mahirap. Dahil gawa po na— maliit na barrio lang po ang Pamarawan ay talaga naman kung pag bumaha, parang minsan wala po nakakalabas ng bahay. Walang nakakapaghanapbuhay dahil doon po ang pinagkukunan ng pinagkakakitaan ng mga mangingisda. Unang una po talaga lahat kung natin po ang hanabuhay talaga nanggagaling sa dagat. Kaya po pagkabumaha or nagkaroon po ng sakuna, talaga po naapektuhan ang ating hanapbuhay lalo na iyong ang unang-unang pangangailangan sa araw-araw, dito po natin talaga kinukuha. Dahil dito sa Pamarawan [ay] yamang dagat po talaga ang hanabuhay natin talaga sa Pamarawan. (It's difficult for me.

Because Pamarawan is just a small barrio, when it floods, it seems like sometimes no one can leave their house. First of all, we live the life that really comes from the sea. That's why when there's a flood or there's a disaster, our work is really affected, especially the first daily needs, that's where we really get it. Because here in Pamarawan, our livelihood really is the marine resources.) (Participant 6, FGD)

Yet with how the residents treat disasters with normalcy, some residents express the limitations that come when disasters engulf the community. For instance, Participant 6 expressed the limited movement that she could exert when flood surrounds their home. While she acknowledged that the very essence of living in the island barangay comes with the fact that the community relies upon the fisherfolk and the marine resources that come with it, it is still difficult to endure occurrences that truly affect how they work every day, and some get stranded inside their homes and fend for themselves. Whether by choice or not, 46% of the residents

answered that they would stay at their homes when they are advised to evacuate by the barangay council. There is also an observable disparity when it comes to leaving their household items when advised to evacuate. Some residents may cite that it would be unsafe to do so, considering that the island barangay also had more inhabitants that they are new to the community and they are not yet familiar with, while still being familiar with other clans who lived there since then.

Nananalanagin, pananalangin. Sa paghahanda po sa mga [sakuna], kamukha nga pong iyong mga sinabi, na dumating yung baha, kailangan po magtaas ng gamit. Nakakaintindi naman kasi pag ka nga sakuna, alerto ang mga tao .Pag ka may parating, magreready sila. (Prayer, prayer. In preparing for [disasters], it looks like what you said, when the flood comes, it is necessary to raise household items. It's understandable because when there's a disaster, people are on alert. When we have something coming, they will prepare.) (Participant 8, FGD)

The participants during the focus group discussion also told how they also consider their faith when disaster strikes, praying for their safety and recovery afterwards. On the island, two major churches sat beside each other: the Stella Maris Mission Parish and the Pamarawan United Methodist Church. With these two churches, residents tend to either engulf themselves in Catholicism or Methodism. For them, faith has always been present in the community, especially with how tight-knit these communities of believers are known to be. The participants, both from the one-on-one interviews and focus group discussion, mentioned the common practice of raising their household items from the ground to avoid being damaged by

floodwater. Most often, they would seek each other's help to raise heavier items like refrigerators and cabinets, evoking bayanihan, or they would synonymously refer to us as 'damayan' (compassion) as neighbors. The survey findings reflect these conditions, with 82% of them expressing that they often need help from fellow residents in times of disaster and 82% of them considering or exercising their faith when disaster strikes.

Residents' DRRM Engagement & Role of Multimedia in Pamarawan

When asked about their engagement in DRR, residents always respond with them raising or tying up their household items and storing canned goods as emergency supplies when it's difficult to leave their houses to prepare food. 74% of the respondents practice the act of saving up food and supplies when times of disaster are approaching the island barangay.

Aba'y naghahanda. Pinaghahandaan namin. Halimbawa e malakas ang bagyo. O de siyempre mag-aano ako ng bahay—magtatali ako ng bahay. Magtatas nito, magtataas ang tubig, magtaatas ng mga gamit mo. Saka mga pagkain na, mga delatang pagkain. Magahanda ka ng pagkain. (Well, getting ready. We are preparing. For example, the storm is strong. Or of course I will [prepare] our house—I will [prepare] our house. It will drain, the water will rise, your belongings will rise. Then foods, canned foods. You will have food ready.) (Participant 2, Interview 2)

With the barangay council advising all zones, this enacts a manifestation of an early warning system, which is crucial in ensuring that all households are informed of

the disaster that will be experienced within a specific duration of time and are advised to evacuate if needed to ensure safety and avoid casualties. 46% of the respondents answered that they often consider their need to evacuate away from their home, which could also correlate with how 70% of the respondents expressed that they follow announcements from the barangay in times of disaster.

Kaya po nga yung sa barangay nagsasabi [o] nagbabalita. Babalita para bago po dumating yung mayroon silang sign. Yung alam na nilang may babala.

(That's why those in the barangay are telling [or] reporting. It will be announced before it arrives, so they will have a sign. They already know there is a warning.) (Participant 10, FGD)

Aside from the barangay council, the latest news from televisions and cell phones was also considered by the residents until the cell signal was cut off due to a variety of reasons, yet knowingly rooted in the island barangay's distant location limiting stable connection and immediate assistance when disrupted. Currently, there are two cell towers on the island, one functioning and one in progress, yet differing from mobile network operators. However, when faced with a power outage, the loss of a strong cell signal will be faced immediately. Hence, the most reliable information will come from the barangay council, which monitors the island, and the households that have their own Internet connection through the aid of solar panels.

Minsan siguro, minsan di rin namin nadadaluhan [training/seminars sa DRRM]. Siguro busy kami sa ibang bagay pero pag naman may patawag naman nila, lalo na yung mga tauhan ng munisipyo, yung mga training sa

yung mga rescue, yung mga ganoon kailangan nandoon [at] alam ng bawat isa sa atin yung ganun. Para in case na emergency nga, hindi tayong mukhang tanga doon sa actual kasi, iba yung actual sa sinusulat. Pag nasa actual ka, doon mo na masasabi ang, hindi mo na magagawa kung kaya mo ba o hindi. (Sometimes maybe, sometimes we don't even attend [training/seminars on DRRM]. Maybe we are busy with other things but when they summon us [to the barangay hall], especially the municipal staff, the training for the rescuers, those who are needed are there [and] each one of us knows that. Just in case it's an emergency, we don't look like fools in the actual situation because the actual situation is different from what is written. When you are in the actual situation, that's when you can say, whether you can do it or not.) (Participant 4, Interview 4)

When asked about their attendance at meetings, trainings, or seminars about disaster risk reduction management, 46% of the survey respondents answered that they often attend them when needed or announced by the barangay council. Yet, like Participant 4 from Hulo expressed, some residents tend to not attend these meetings due to how they will always be conducted in the barangay hall at Balot, which is the nearest district to the port, which will be quite far from the two opposite districts like Gitna and Hulo. Yet, he acknowledged that such meetings are necessary in preparing for anything that could happen when disasters strike, expected or not. It is just a shame that most of the time residents like him weren't available to attend due to other reasons. Regardless of these circumstances, there is an observable theme that the barangay council only has the capacity to conduct these meetings in the barangay hall. This inquiry sparks the barangay's need to have more communal

spaces, especially in each district, for them to be able to stably communicate with them, especially in times of urgent concerns. But for them to exert efforts to this, the barangay would also need to request funds and justify the pursuit of these highly needed improvements to community discussions and support systems.

Ang magpapatatag sa iyo rito ‘yung— siyempre mga ka-barrio mo na sa oras ng sakuna [ay] nakangiti pa rin ang mga tao rito. Hindi mo makikitang malungkot, hindi mo makikitang nag-iiyakan. Walang nagugutom dito na kahit naman na—ganyan lang dito ang cycle ng buhay dito. Tag-ulan [o] tag-araw, masaya pa rin, ganyan lang. Basta ngingiti ka lang, h’wag mong seseryosohin ‘yung laban dito, wala lang gaon lang lagi ang gagawin mo dito. (What will stabilize you here is that—of course, your neighbors at the time of the disaster [is that] the people here are still smiling. You will not see him sad; you will not see him crying. No one tends to be starving here anyway—that’s just the cycle of life here. Rainy [or] summer, it’s still fun, that’s all. Just smile, don’t take this fight too seriously, or you’ll always resort to that habit.) (Participant 4, Interview 4)

What has always been prominent in the faces of the Filipinos when struck by a typhoon can also be observed among the residents of Pamarawan. There is a strong visibility of resilience that empowers the residents to help each other and find happiness and humor in their circumstances. Participant 4 pinpointed that residents will always be smiling amidst the disasters that they face, as they help each other and share food when necessary to overcome fear and isolation during their trying times in their respective households. This is also what Participant 1 emphasized:

there has always been the spirit of 'damayan' (compassion) among the residents, especially with the ancestral clans who have always lived there since. In the survey results, 90% of the respondents considered the community of Pamarawan as resilient, and 66% of them considered it as a safe place during times of disaster. Furthermore, Participant 1 provided an analogy in which he expressed that Pamarawenos can freely let their neighbors in their households without any fear that it will be risky and lead to crimes, whereas the city proper will not consciously let their neighbors inside their houses with the fear that their belongings will be stolen, citing security risks. Reinterpreting his words, the neighbors have always been a helping hand whenever they need immediate assistance, especially when raising their heavy household items.

E yung ano, makikipagkaisa ka lang, sa mga katungkulan kung anong sinabing mapapabuti [ay] susunod ka para ika nga. Kasi hindi komo nasa loob sila ay safe sila. May darating na panahon na bigla naman na talagang ang kalikasan ay naiiba ang takbo. Kailangan makikipagkaisa sila. Makikinig sila sa mga nagsasabi ng—lalo na pag may babala ang bagyo kung malakas diba. (So, what, you will just cooperate, with the authorities that will bring improvement, [you will] follow them. Just because the residents are inside [in their own houses], they are safe. There will come a time when suddenly nature really changes the course. They must unite. They will listen to those who say—especially when there is a warning about the storm if it is strong, right?) (Participant 8, FGD)

As the women vocalized in the focus group discussion, there has always been a better outcome when residents adhere and cooperate with the authorities. While they acknowledged the importance of place-based knowledge manifested through elders' knowledge, Marites (gossiping), etc., there will always be a dependence on the expertise of the authorities, as they believe they are working for the best interests of the community and will serve them, especially when things start to become taxing as nature changes course. Participant 1, who is also engaged in working with the barangay council, highlighted that coastal governance relations among neighboring coastal barangays also aid the effectiveness of immediate resolutions when disasters engulf their communities. He expressed how crucial it was for him to acknowledge that service for the people strengthens his resilience to the disasters and to ensure that his place-based knowledge will be passed on to the next generations, citing newly wedded and newly established families anchoring sustainable practices in the community.

In terms of its role, 68% of the survey respondents considered multimedia such as TV and cellphones as important in their community. This reflects how they view cellphones as a way to communicate with their loved ones, whether to virtually talk to them or reach out for the latest news surrounding weather forecasts, class suspensions, etc. Some residents would also cite the cellphone usage to talk to their loved ones abroad. Yet, the capabilities of multimedia, like cellphone usage in the island barangay, remain limited due to the intrinsic occurrence of power outages, which subsequently affects the cell tower that they rely on.

Often times, residents from different puroks will gather in several spots on the island where they could acquire average to good cell reception just to keep the communication going. This is also prevalent with the local governance relations, with lesser difficulties due to how Pamarawan's barangay council equips themselves with sufficient equipment to conduct DRRM protocols. The use of TV also suffers when the power outage commences, and what's left is for the cellphones to drain their batteries. While this remains to be a common experience among the residents, several households now use solar panels to garner electricity when needed. Occasionally, the residents would ask the owners to charge their devices, with some of them requesting a minimal monetary fee in return. For Participant 1, the use of solar panels not only benefits the community but also ensures that the communication between island barangays and the city government in the city proper is continuous, regardless of whether there is a power outage or lack of equipment or electricity to stabilize the cell reception.

ICT-for-DRRM Practices & Replication

This research question specifically aimed to enumerate and explore the ICT-for-DRRM practices of Pamaraweños in the coastal barangay in the time of disasters. Both qualitative and quantitative data collections were embedded with the intent of expounding on how the coastal community uses ICT, given their geographical location, which makes it difficult to sustain seamless communication between the city proper and power supply due to the presence of disasters. Table 8 organizes the themes and highlighted quotes supporting the insights of the residents to reinforce disaster resilience in their daily living.

Table 6. *ICT-for-DRRM themes from qualitative data collection*

Themes	Highlighted Quotes
Cellphone usage	<p>“Right now, what I can suggest [is] cell phone which is really the best communication. Because the day I remembered, if you send a telegram, the person you are going to is already dead. Isn't that true nowadays because the cellphone is the easiest. On the spot, if you have a load, those who ask for help or if you have something important to say will arrive immediately (participant 10, FGD).”</p> <p>“When we can't do it anymore, we just call or contact [the] cell phone. [We only go] here in the barangay. Totally not because— when there's a disaster, I don't go home. Sometimes it's different when there really is no place to stay. But if you can, just [stay] here. [If not,] We are leaving to go to my in-laws outside of Pamarawan (participant 3).”</p> <p>“The cell phone, for example the cell phone. The video call, the video call because back in the day there was no video call, only the telegram, the letter. Before the letter reaches you— For example, write to a family member. Before that arrives for a long time, days will be counted before your family member finds out what happened to you, the news. But now, we are high-tech now. With a cell phone, you can make video calls. Any time, you can as long as you have a signal. As long as you have a load, you can call, you can do that (participant 4).”</p>

TV usage	<p>“On TV. The places and times are announced immediately. So, when it's still far away, just one week away, you're already preparing [for] whatever happens, because you don't know if it's strong or weak (participant 7, FGD).”</p>
Solar panels	<p>“Solar [panels] are used here, we can no longer suffer from long brownouts [...] just a few residents [own it] (participant 7, FGD).”</p> <p>“Because nowadays solar [panels] are common. Even if there is a brownout, I use the TV, I use the cell phone, we can charge. Usually when that day there is a brownout like that, the others take [power] from the solar [panels], so that the communication can still continue (participant 1).”</p>

Source: Qualitative data findings, March 28-29, 2025

The abovementioned table enumerates the residents’ ICT-for-DRRM practices, and most of these practices can only be carried out when there are no power outages and there is continuity when they have the capacity to purchase solar panels, like several households did. The same goes for the use of televisions; once it falters, its crucial value to deliver the latest news will cease to exist once there is a power outage and other residents can only ask their neighbors if they heard something on their working devices. Residents like Participant 2 also cited the use of radio when there is no device that they can have access to when a prolonged power outage occurs, relying on several radio stations that broadcast news and weather forecasts, informing them of what to be wary of. Along with this, the interviewees expressed how counterproductive it is for the cell tower to have an emergency generator that they can request from the network provider but will only support the

cell tower for a short duration of time. Often times, the network provider will fetch the generator the next day, which could redundantly bring forth the same situation in which the residents would need their immediate assistance to keep the cell reception stable. Participant 1 claimed that having a permanent generator for the cell tower will be more beneficial for the residents of Pamarawan. Whether communicatively or economically, sustaining the cell reception amidst disasters will aid the residents in continuing their daily activities amidst wading in brackish water. He also advocated the need for each purok to also have a standby generator, and each purok will have a designated resident to take care of the equipment. This is in line with his observation that when a power outage occurs, after four hours, the cell tower will be unusable.

With all of these ICT-for-DRRM practices, all participants from the interviews and focus group discussion agreed that there will be no difficulties if their practices are replicated by other coastal communities, especially the neighboring coastal barangays like Namayan and Masile. Rather, there is a concern that replications of these measures will be difficult and ignored by those who live in the city proper. For they have mentioned that there is no disparity of place-based knowledge concerning disasters among those who govern coastal areas of the city compared to those who govern the inland barangays, since their approach obviously differs from the residents who engulfed their lives with the brackish water in the coastal areas. For Participant 1, he expressed that there has been a difficulty in translating and communicating the experiences of the coastal communities in a governance meeting. He often experienced that there are doubts concerning how Pamarawenos stabilize themselves compared to how inland barangays handle DRRM in a different

notion. The participant also cited how the barangay experienced both an earthquake and a typhoon, which brought the floodwater to chest level but eventually subsided after two to three hours. Hence, in the most extreme situations, the Pamarawenos tend to be quite resilient. He asserted that along with the elderly residents of the barangay, they do not believe that The Big One will ever happen, despite the abundance of scientific studies that conclude it is probable to occur, specifically impacting the coastal communities like Pamarawan first.

Identified Hazards, Exposure, Vulnerability & Capacity

Table 7. Observed Disaster Risk Elements

Observed Disaster Risk Elements	
Hazard	<ul style="list-style-type: none"> • Flooding caused by high tide, storm surge, and typhoon • Prolonged power outage • Sea level rise • Pollution, specifically trash scattered around Manila Bay
Exposure	<ul style="list-style-type: none"> • Infrastructures built on the most low-lying areas of the barangay • Houses built near the coastlines • Houses built closely to each other • Limited number of mangroves as nature-based barrier
Vulnerability	<ul style="list-style-type: none"> • Houses with roofs made with GI sheets (yero) • Make-shift houses made with bamboos

	<ul style="list-style-type: none">• Single or one-way cemented road
Capacity	<ul style="list-style-type: none">• Disrupted source of income, especially when disaster strikes (e.g, difficult to catch fish, inaccessible stores)• Contested land and house ownership• Lack of decentralized dissemination of news• Lack of up-to-date ICT devices• Lack of firemen and equipment• Limited cell reception and Internet connection

Up to this day, there are still houses in Barangay Pamarawan with roofs made of galvanized iron (GI) sheets, locally known as "yero," and some makeshift houses constructed from bamboo. These types of housing materials contribute significantly to the vulnerability of residents during disasters, as they offer limited protection against strong winds, heavy rains, and flooding. Additionally, several families reside near the coastlines, placing them at heightened risk from sea waves, storm surges, and floodwaters, which are common hazards in coastal barangays exposed to typhoons and high tides.



Figure 2. Flood hazard map of Pamarawan. Screenshot from Project NOAH (2025). Licensed under the Open Data Commons Open Database License (ODC-ODbL).

The geographical location of these houses in low-lying areas exacerbates their exposure to flooding. Moreover, many houses are built closely together, which increases the risk of fire spreading rapidly through the neighborhood. Although fire incidents are reportedly rare in the barangay, the lack of professional firefighting personnel and equipment poses a serious concern. According to Participant 1, the community relies solely on a basic extinguishing device consisting of a machine/generator with a 5-km hose that draws water directly from the sea to combat fires, highlighting the limited capacity to respond effectively to such emergencies. This combination of hazard exposure, structural vulnerabilities, and limited disaster response capacity underscores the urgent need for enhanced disaster risk reduction measures in Barangay Pamarawan to safeguard its residents and infrastructure.

V. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

This mixed-methods study aimed to resituate disaster resilience through ICT-based management in the island-barangay of Pamarawan, Malolos City. While there is an abundance of studies tackling other DRRM elements, the study sought to explore the aspect of disaster resilience in this specific coastal barangay. The study specifically pinpointed its objectives through observing (1) how residents perceived disasters and utilized strategies to enhance disaster resilience and (2) engaged in DRR activities. Furthermore, it explored (3) how multimedia plays a crucial role in the coastal community of Pamarawan, even if its DRRM activities are intrinsically limited due to its geographical location. Lastly, the study observed (4) which ICT-for-DRRM practices the residents found to be effective towards disaster resilience and tackled the possible replication of these practices in other coastal areas.

Data garnered in this study were anchored to the exploratory sequential mixed methods research design and use of sequential purposive sampling to fulfill the objectives of the study. Theoretical underpinnings of the study included social justice theory and resilience theory to ensure that the research problem will be addressed. The study invited a total of sixty-five participants for the two phases of the data collection. For the first phase, which is qualitative, the researcher discussed with four residents from different districts (purok) for one-on-one interviews and eleven women for a focus group discussion. The insights from these interviewees were gathered, transcribed, and analyzed through thematic analysis. Themes and

quotes from the respective transcripts of these interviews were used to develop the research instrument for the quantitative data collection, which was the 5-point Likert-scale survey questionnaire. The final versions of the questionnaire were written in both English and Filipino, but the researcher ultimately decided to only disseminate the Filipino version for ease of access, especially for those residents who are not proficient in English. The survey questionnaire was disseminated among sixty-one respondents but eventually satisfied the target quantity of fifty responses, with the other eleven responses discarded due to invalidity (e.g., lack of signature for consent form, lack of specified age and district information, and missing survey items).

A Cronbach's alpha of 0.949 pinpointed the excellent value of internal reliability among the fifteen items of the survey questionnaire. Due to a small sample size ($n=50$), construct validity cannot be pursued by the researcher. Face and content validity were navigated with the research advisor due to time and resource constraints. The responses from the survey were tallied and analyzed to provide the quantitative findings of the study.

With the joint findings from the qualitative and quantitative data collection, the study yielded results that could address its hypotheses. The findings of the study pinpointed the rejection of the null hypothesis and accepted the alternative hypothesis that the residents of Pamarawan perceive disasters as significant threats to their community, as well as that they employ specific strategies towards enhanced disaster resilience. While they treat disasters with normalcy, the residents ultimately acknowledge the significant impact of disasters on their daily livelihood (e.g., income, household safety, cell reception, etc.).

Then, it is observed that there is a strong relationship among the awareness and use of multimedia tools in DRR methods and the participation of the residents in DRR activities. In addition to this, the residents expressed their openness and participation towards DRRM-related meetings commonly held in the barangay hall, but they differ in terms of access to such devices. Lastly, the findings observed that the extent of Pamarawenos' further participation in DRRM programs can be boosted when multimedia or ICT-based interventions are used. This observation can be highlighted by their openly expressed usage of cell phones, televisions, and even the accompaniment of solar panels to stabilize communication and dissemination of the latest news (e.g., weather forecasts, class suspensions, etc.).

Conclusion

Resituating the concept of disaster resilience in a coastal community is a great opportunity to demonstrate how DRRM can be amplified and accompanied by multimedia tools. The breadth of the research studies tackling Pamarawan as the central topic hasn't addressed the aspect of disaster resilience and how this supports the praxis of disaster justice, along with the fulfillment of DRRM. Hence, the primary focus of this study is to reexamine and resituate the concept of disaster resilience within the context of Pamarawan Island, Malolos City, by investigating the role of ICT-based management in disaster risk reduction and response. As aforementioned, this study specifically addressed the lack of scholarly attention given to disaster resilience, despite its frequent selection as a research site, and aimed to understand how residents perceive and respond to disasters compared to other, better-resourced communities (e.g, inland barangays of Malolos). By exploring the

community's unique geographic isolation and its limited utilization of available technologies, the study sought to uncover the underlying reasons for the gap between technological exposure and actual ICT adoption for disaster resilience.

With the joint findings of the study, it yielded several key findings that confirmed the following statements:

- Residents of Pamarawan Island perceived flooding and climate-related disasters as significant threats to their community, and they employ specific strategies to enhance their disaster resilience.
- The awareness and use of multimedia tools in disaster risk management methods has a strong relationship with the participation of Pamarawan residents in disaster risk reduction (DRR) activities.
- Residents of Pamarawan Island are far more probable to participate in disaster risk reduction management (DRRM) programs when multimedia interventions are used.
- The residents considered the usage of multimedia tools (cellphone and TV) as important.
- The residents agreed that the community of Pamarawan is considered resilient.
- The residents confirmed that they consider Pamarawan safe during disasters

Other observations include the Pamarawenos acknowledging that they need help from both the barangay council and the residents. Furthermore, the residents' DRRM strategies include saving food and supplies, practicing faith, and adhering to the barangay council's announcements. However, some residents also expressed that

they would rather evacuate to the city proper instead of staying on the island-barangay. The residents strongly consider the cell reception in times of disasters, which is also critically affected by power outages. In addition to this, the residents were able to attend DRRM-related meetings but also expressed that there are factors that make them unable to participate. Highlighted factors include the default location (barangay hall), income, etc. The influence of multimedia interventions was observed through the strong presence of cellphone and TV usage among the residents of Pamarawan. The study also revealed that there is a scarcity of firemen and immediate equipment, posing risks among the residents.

While the residents of the island-barangay considered themselves resilient and Pamarawan as a safe place in times of disasters, the findings provided that there are deficiencies when it comes to the capability of the island-barangay to be highly resilient. The coastal community of Pamarawan is intrinsically vulnerable to disasters due to its geographical location. Its location further makes it difficult to streamline measures that may be effective among inland barangays but fail to convey the same outcome to coastal barangays like Pamarawan. The island barangay is yet another example of a community with resilient inhabitants living in a highly vulnerable location. The island is prone to flooding due to high tide, storm surge, and typhoons. Power outages, especially when prolonged, maximize disaster risks and miscommunication among governance relations. Then, climate change continues to impact sea level rise across the globe, and Pamarawan, as one of the most exposed coastal barangays to the sea, sparks more inquiries to better understand its circumstances and improve its resistance to disasters. For instance, there are infrastructures built near the coastlines and closely next to each other. Then, there

are houses that lack structural stability due to the roof being made with GI sheets (yero); some also live their daily lives in makeshift houses out of bamboo, which is especially worth highlighting as the island-barangay doesn't have any firemen or equipment for unexpected fire incidents that may occur in the near future.

With the sheer presence of their resilience, whether self-learned or passed on to them, their capacity as a community may limit them from enhancing their households' resilience towards disasters. When struck with flooding, the source of income tends to be disrupted, especially for fisherfolk and storeowners. There is also contested land and house ownership, which could also limit their actions to upgrade their houses. The lack of decentralized dissemination of news may further restrict other residents from other districts from acquiring up-to-date news and announcements. Their individual and household capability to own cell phones and televisions may also isolate them from being informed about what to do and what to expect. And finally, the ever-continuing scarcity of stable cell reception and Internet connection further detaches the community from reaching more livable conditions like the inland barangays.

The study opened up the possibility that there is more to the aspect of compliance-oriented planning that Rivera (2024) pointed out. Generalizing the key findings observed from both phases of the data collection, the compliance-oriented planning towards DRRM may also posit occurrences of communities like Pamarawan adhering to these measures but clearly lacking sufficient tools to uphold the average fulfillment of these protocols. The clear display of cooperation among the coastal barangays and the residents, amidst the conditions that they are in,

illustrates them as a sustaining ecosystem towards safety and disaster resilience. Moreover, the island-barangay's scarcity of firemen and equipment may also reflect the extent of available ICT-for-DRRM devices on the island. A common denominator for this scenario is the budget and mode of transport to acquire these tools. The only mode of transportation on the island is boat rides, making it difficult to transport and house these tools that could alleviate the observed gaps. The lack of an abundant budget allocated to coastal barangays may visualize the mismatch of budget allocation that could make the barangays more livable, stabilizing the probability of residents pursuing coastal emigration. The study emphasized the need to reassess the budget given to these coastal barangays and the policies that may overlook the specific conditions that these communities live with. Hence, the co-existence of the residents living and wading through the brackish waters may go unnoticed due to how overlooked coastal conditions are treated on paper.

Amidst these observations, the researcher would also like to acknowledge the limitations of the study that could have made the study encompass a more desirable resolution to the research problem. This includes utilization of a bigger sample size and constraints concerning time and resources. As the brackish water subsided, Participant 1 left a great note for the researcher before leaving the premises of his home: "When you're at the top, look at us to see if we are drowning (Kapag kayo ay nandoon na sa tuktok, tignan niyo kami at baka kami'y nalulunod.)"

Recommendations

As the study observed lapses that restrict the community from becoming highly resilient, on paper or not, the researcher enumerated several recommendations for future studies, as well as relevant elements that could support the DRRM praxis. This list of recommendations was also expounded on in the sixth chapter of the manuscript, as the central objective mentioned in the hypothesis and significance of the study sections is to come up with a policy brief to inform researchers, authorities, and policymakers concerning the issue. To expound on the breadth of studies concerning coastal disaster resilience, future researchers should utilize larger sample sizes and also complement methodologies with diversity among selected participants to overcome thematic saturation.

- To enrich the exploration of coastal communities, future researchers should consider studying the knowledge of the youth, the aged population of communities, deficiencies in critical public facilities, coastal emigration, etc., and how they influence the efforts towards disaster risk reduction management (DRRM).
- To further utilize academe-government relations, STEM professionals should explore how to innovate climate-smart and nature-based resolutions towards land erosion, sea level rise, flooding, etc.
- To provide a comprehensive resolution on paper, policymakers should look into existing DRRM policies and pursue inclusion of protocols for underserved and geographically isolated locations across the country to avoid the probability of ensuing compliance-oriented planning and minimize potential risks as originally intended.

- To strengthen archival of place-based knowledge and support towards coastal residents, the local government unit should regularly conduct discussions with concerned residents to restore communication and complement the action plan with their involvement to ensure problems will be resolved with full attention.
- To sustain progress towards collaborative infrastructural projects, the local government unit should also look into investing in disaster resilience, as synonymously advocated by the United Nations' 2025 Global Assessment Report on Disaster Risk Reduction.
- To alleviate communication lapses, the local government unit should also invest in up-to-date ICT tools that could further amplify the presence of multimedia in complementing the DRRM protocols of the coastal communities, as well as partner with other telecommunications providers to stabilize the residents' access to stable cell reception and Internet connection.
- To make the community self-sustaining in terms of electricity access, the local government unit must also spearhead discussions concerning the pursuit of solar-powered communities with Meralco and other partners, partaking in the campaign towards investment and reliability in renewable energy.
- To reduce ecological risks, the local government unit should reassess the appropriateness and the progress of mangrove planting projects for the past years and minimize waste across Manila Bay through joint government efforts.

Key recommendations were also illustrated in the policy brief, which is also attached in the appendices of this manuscript.

POLICY RECOMMENDATIONS

1. Localize DRRM Plans

In pursuit of a more comprehensive resolution on paper, policymakers should look into existing DRRM policies and pursue inclusion of protocols for underserved and geographically isolated locations across the country to avoid the probability of ensuing compliance-oriented planning and minimize potential risks as originally intended

2. Benchmarking of Localized Knowledge

Coastal residents' knowledge concerning disasters vary depending on their experiences. To strengthen archival of place-based knowledge and support towards coastal residents, the local government unit should regularly conduct discussions with concerned residents to restore communication and complement the action plan with their involvement to ensure problems will be resolved with full attention.

3. Invest in Disaster Resilience

To sustain progress towards collaborative infrastructural projects, the local government unit should also look into investing in disaster resilience, as synonymously advocated by the United Nations' 2025 Global Assessment Report on Disaster Risk Reduction.

4. Financing ICT-for-DRRM Equipment

To alleviate communication gaps, the local government unit should also invest in up-to-date ICT tools that could further aid multimedia in complementing the DRRM protocols of the coastal communities.

These findings are from Corales' 2025 study entitled Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT Based Management in Pamarawan Island, Malolos City

POLICY RECOMMENDATIONS

5. Produce Multimedia-based Interventions

The local government unit should also invest in up-to-date ICT tools that could further amplify the presence of multimedia in complementing the DRRM protocols of the coastal communities, as well as partner with other telecommunications providers to stabilize the residents' access to stable cell reception and Internet connection.

6. Utilize Renewable Energy (Solar)

To make the community self-sustaining in terms of electricity access, the local government unit must also spearhead discussions concerning the pursuit of solar-powered communities with Meralco and other partners, partaking in the campaign towards investment and reliability in renewable energy.

7. Regulate Nature-based Projects

To reduce ecological risks, the local government unit and Department of Environment and Natural Resources (DENR) should reassess the appropriateness and the progress of nature-based projects such as mangrove planting projects for the past years and minimize waste across Manila Bay through joint government efforts.

8. Collaborate with Academe & STEM

To further utilize academe-government relations, the local government unit (LGU) and STEM professionals should explore how to innovate climate-smart and nature-based resolutions towards land erosion, sea level rise, flooding, etc.

These findings are from Corales' 2025 study entitled Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT Based Management in Pamarawan Island, Malolos City

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APPENDICES

APPENDIX A
Ethics Certificate

**PANEL ON
RESEARCH ETHICS**

Navigating the ethics of human research

TCPS 2: CORE 2022



Certificate of Completion

This document certifies that

Shedorlaomar Corales

*successfully completed the Course on Research Ethics based on
the Tri-Council Policy Statement: Ethical Conduct for Research
Involving Humans (TCPS 2: CORE 2022)*

Certificate # 0001366517

1 November, 2024

APPENDIX B
Interview Guide

These questions are for the implementation of the qualitative data collection of the study entitled “Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT-Based Management in Pamarawan Island, Malolos City”

Interview Guide on Disaster Resilience in Pamarawan Island, Malolos City	
Areas of Inquiries	Questions (in English)
Perception of the Pamarawan Island residents	<ul style="list-style-type: none"> • How do you perceive disasters in your barangay? • What do you do to be resilient against frequent disasters? • How did you learn about ways to approach the impact of disasters in the flood-prone barangay?
Residents’ engagement with DRR	<ul style="list-style-type: none"> • What particular disaster risk reduction measures does your barangay undertake? • How do individuals within your community get involved with planning and activities related to disaster risk management? • What difficulties does your community have to overcome in order to put disaster risk reduction measures into practice?
Role of multimedia in DRRM strategies for coastal communities	<ul style="list-style-type: none"> • Can you share instances of the dissemination of critical information during disasters using social media or other digital platforms? • What improvements would you suggest for using multimedia in future disaster risk reduction initiatives?
Impact of multimedia interventions on community involvement in DRRM initiatives	<ul style="list-style-type: none"> • Which multimedia tools—such as social media, mobile apps, films, and community radio—are being used in your community to lessen the risk of disasters? • Do you think there are any specific aspects where multimedia products need improvement or are lacking? • How could educational multimedia content—such as infographics or videos—improve understanding of disaster response measures?
Effective ICT-for-DRRM practices in the coastal community of Pamarawan	<ul style="list-style-type: none"> • Are there any effective ICT practices in your community that you think other communities could adopt? Which ones, if any, and why? • Which types of communications or information made possible by ICT have, in your experience, been most beneficial for disaster preparedness?
Replication of best practices for	<ul style="list-style-type: none"> • If we attempted to duplicate effective ICT practices from different areas in Pamarawan, what difficulties do you think may occur?

Interview Guide on Disaster Resilience in Pamarawan Island, Malolos City

improved disaster
resilience

Filipino version

Interview Guide on Disaster Resilience in Pamarawan Island, Malolos City

Areas of Inquiries	Questions (in Tagalog)
Perception of the Pamarawan Island residents	<ul style="list-style-type: none"> • Paano mo maisasalarawan o nakikita ang mga sakuna sa inyong barangay? • Ano ang ginagawa mo upang maging matatag sa harap ng mga sakuna? • Paano mo natutunan ang mga pamamaraan upang harapin ang mga epekto ng mga sakuna?
Residents' engagement with DRR	<ul style="list-style-type: none"> • Anong partikular na mga hakbang ang ginagawa sa iyong barangay kapag may sakuna? • Paano nakikilahok ang mga indibidwal sa iyong komunidad sa pagpapalano at mga aktibidad na may kaugnayan sa pamamahala ng panganib ng sakuna? • Anong mga kahirapan ang kailangang malampasan ng iyong komunidad upang maipatupad ang mga hakbang sa pagbawas ng panganib ng sakuna?
Role of multimedia in DRRM strategies for coastal communities	<ul style="list-style-type: none"> • Maaari ka bang magbahagi ng mga halimbawa ng pagpapakalat ng mahahalagang impormasyon sa panahon ng mga sakuna gamit ang social media o iba pang digital na plataporma? • Anong mga pagpapabuti ang maaari mong imungkahi para sa paggamit ng multimedia sa mga hinaharap na inisyatiba sa pagbawas ng panganib ng sakuna?
Impact of multimedia interventions on community involvement in DRRM initiatives	<ul style="list-style-type: none"> • Aling mga tool sa multimedia—tulad ng social media, mobile apps, pelikula, at community radio—ang ginagamit sa iyong komunidad upang bawasan ang panganib ng mga sakuna? • Sa tingin mo ba ay mayroong tiyak na aspeto kung saan ang mga produktong multimedia ay nangangailangan ng pagpapabuti o kulang? • Paano mapapabuti ng educational multimedia content—tulad ng infographics o videos—ang pag-unawa sa mga hakbang sa pagtugon sa sakuna?

Interview Guide on Disaster Resilience in Pamarawan Island, Malolos City

Effective ICT-for-DRRM practices in the coastal community of Pamarawan	<ul style="list-style-type: none">• Mayroon bang epektibong ICT practices sa iyong komunidad na sa tingin mo ay maaaring tularan ng ibang komunidad? Alin, kung mayroon man, at bakit?• Aling uri ng komunikasyon o impormasyon na pinadali ng ICT, ayon sa iyong karanasan, ang pinaka-kapaki-pakinabang para sa paghahanda sa sakuna?
Replication of best practices for improved disaster resilience	<ul style="list-style-type: none">• Kung susubukan nating ulitin ang epektibong ICT practices mula sa iba't ibang lugar sa Pamarawan, anong mga kahirapan ang maaari mong isipin na maaaring mangyari?

APPENDIX C
Informed Consent Form

FORM NO.: _____

INFORMED CONSENT FORM

(Dokumentong pagbibigay ng pahintulot)

PART I: INFORMATION SHEET <i>(Pahinang pang-impormasyon)</i>	
Research Title <i>(Pamagat ng pananaliksik)</i>	Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT-Based Management in Pamarawan Island, Malolos City
Researcher <i>(Mananaliksik)</i>	Shedorlaomar Clavio Corales BA Multimedia Studies, University of the Philippines Open University sccorales@up.edu.ph
Research Adviser <i>(Gurong tagapayo ng mananaliksik)</i>	Dr. Ruth B. Rodriguez Assistant Professor, University of the Philippines Open University
RESEARCH INFORMATION <i>(Impormasyon tungkol sa pag-aaral)</i>	
Background <i>(Kaligiran ng pag-aaral)</i>	To be explained through personal communication with interviewee/s.
Purpose of the Study <i>(Layunin ng pag-aaral)</i>	The purpose of this study is to resituate disaster resilience through ICT-based management in Pamarawan Island, Malolos City. The central problem in this study is to resurface the discourse surrounding disaster resilience in the community due to the scarcity of studies tackling this matter amidst Pamarawan Island being a known site for research studies. Specifically, the study seeks to know the following:

PART I: INFORMATION SHEET <i>(Pahinang pang-impormasyon)</i>	
	<ol style="list-style-type: none"> 1. To explore place-based perceptions of disasters and strategies that enhance disaster resilience among residents of Pamarawan Island; 2. To culminate the residents' approaches in engaging with disaster risk reduction activities; 3. To identify the role of multimedia in DRRM initiatives on Pamarawan Island; 4. To enumerate the ICT-for-DRRM practices and its effectiveness in the coastal community of Pamarawan and explore their potential for replication to improve disaster resilience in similar contexts.
Procedures of the Study <i>(Pamamaraan ng pag-aaral)</i>	<p>The study will utilize exploratory sequential mixed methods to have thorough information on the community's perceptions, behaviors, and best practices in reinforcing disaster resilience in a flood-prone barangay like Pamarawan. The use of mixed methods research is crucial in providing extensive answers to the situated inquiries in the study, in which both qualitative and quantitative data analysis will intertwine to encompass a thorough exploration of the problem. For the qualitative phase, a semi-structured interview guide will be used for the following approaches: five (5) one-on-one interviews and one (1) focus group discussion involving 7 participants.</p> <p>For the quantitative phase, a structured survey questionnaire will be embedded with the insights garnered from the qualitative phase. The structured survey questionnaire shall be reviewed by the research adviser before commencing its dissemination to the participants.</p>
Benefits <i>(Mga kapanakibangan)</i>	<p>The study's benefits include the following:</p> <ul style="list-style-type: none"> • The study will be important in documenting the practices of the residents towards facing disasters on the island. • The study will be beneficial in resurfacing the conversations about disaster resilience in coastal settings. • The study will contribute towards a collection of studies that tackle the island of Pamarawan.
Risks	<p>The study doesn't contain any identifiable risks within its content in line with respecting the island and its residents.</p>

PART I: INFORMATION SHEET (Pahinang pang-impormasyon)	
(Mga kapahamakan)	
Cost of Participation (Halaga ng pagsali)	Participants in this research study will not be charged any fees.
Payment or Remuneration (Pagbabalik-bayad)	Participants of the one-on-one interviews and focus group discussion will each receive a token of appreciation from the researcher once the interview/discussion is done.
Confidentiality (Pagpapanatili ng kompidensyalidad ng impormasyon)	The researcher will uphold and honor the participants' right to privacy in compliance with the Data Privacy Act of 2012. Consequently, all data collected from participants will be utilized solely for academic purposes. Personal information, audio recordings, transcripts, and other materials provided by participants will be accessible only to the researchers involved in the study. The results or findings of this research will be shared with the researcher's university, but it can also be shared at conferences and publications to contribute to the discussion on community safety against disasters.
Voluntary Participation (Kusang pagsali sa pag-aaral)	Participation in this study is entirely voluntary. Participants have the option to skip any questions they prefer not to answer and may withdraw from the study at any point.

PART II: CERTIFICATE OF CONSENT (Sertipiko ng pagbibigay ng pahintulot)	
<p>(In English)</p> <p>I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. <i>I consent voluntarily to be a participant in this study.</i></p> <p>(In Filipino)</p> <p>Nabasa ko ang mga naunang impormasyon, o ito ay binasa sa akin. Nagkaroon ako ng pagkakataon na magtanong tungkol dito at ang anumang mga tanong na aking itinanong ay</p>	

PART II: CERTIFICATE OF CONSENT

(Sertipiko ng pagbibigay ng pahintulot)

nagkaroon ng tugon sa aking kasiyahan. ***Ako ay kusang loob na sumasang-ayon na maging kalahok sa pag-aaral na ito.***

Printed name & signature of the participant
(Lagda at pangalan ng lahok)

Printed name & signature of the researcher
(Lagda at pangalan ng mananaliksik)

SHEGORLAOMAR C. CORALES
Student Researcher

Date
(Petsa - MM/DD/YYYY)

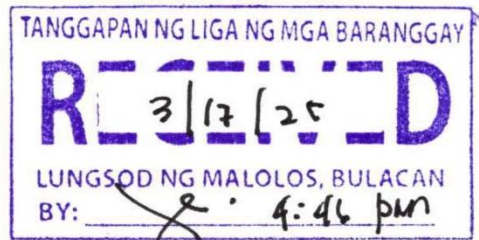
APPENDIX D
Endorsement Letter from CDRRMO



CITY GOVERNMENT OF MALOLOS
CITY DISASTER RISK REDUCTION AND MANAGEMENT OFFICE

March 17, 2025

HON. CESAR S. BARTOLOME
President, Association of Barangay Captains
Chairman, Brgy. Pamarawan
City of Malolos, Bulacan



Dear **Hon. Bartolome**:

The undersigned is respectfully endorsing **Ms. Shedorlaomar Clavio Corales**, a fourth year BA Multimedia Studies student from the University of the Philippines who sought assistance in conducting a research study in Pamarawan Island focusing on disaster resilience among its residents entitled "*Sailing across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT-Based Management in Pamarawan Island, Malolos City*". The proposed dates for the conduct of study are as follows:

- March 28-29, 2025 – onsite interview and focus group discussions
- April 4-5, 2025 – survey

We would like to request for your kind assistance to Ms. Corales in facilitating the data gathering activity within the territorial jurisdiction of Brgy. Pamarawan, City of Malolos.

Attached is the letter from Ms. Corales for your reference and perusal.

Should you have queries, please contact Ms. Corales through 0996-975-7642 or you may reach our DRRMO representatives with these contact details: 931-8888 (local 2106) / 0931-003-5758 / cityofmalolos.drrmo@gmail.com.

Thank you very much and *Mabuhay po kayo!*

Very truly yours,


MS. KATHERINA PIA D. PEDRO
Local DRRM Officer IV

 CDRRMO Operations Center, Gov't Center,
Brgy. Bulhari, City of Malolos, Bulacan
 +63-44-931-8888 (loc. 2106)
 cityofmalolos.drrmo@gmail.com

APPENDIX E
Certificate of Appearance (QUAL Phase)



Republic of the Philippines
Province of Bulacan
City of Malolos
Barangay Pamarawan
OFFICE OF THE BARANGAY CAPTAIN

CERTIFICATE OF APPERANCE

CESAR (BELTY) S. BARTOLOME
Punong Barangay

Mga Kagawad

JONNEL F. CRUZ

RENDON B. DELA PENA

FERDINAND R. CRUZ

PABLITO M. SAMANIEGO JR

JUNELL M. MERCADO

ERMAN M. BORLONGAN

MINANDRO A. RAMOS

SK - JHONAS B. CRUZ

ROLDAN M. DAYAO
Kalihim

NOMERIANO R. CRUZ

LUDIVICO B. CABIGAO
Administrator

IAN PAOLO J. FRANCISCO
Ingat Yaman

EDUARDO A. DAYAO
Chief of Brgy. Police

VIRGILIO M. CRUZ JR
Deputy Chief of Brgy. Police

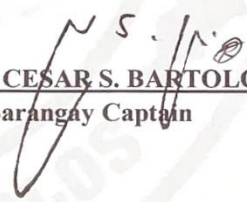
March 28,2025

DATE

THIS IS TO CERTIFY THAT MR. SHEDORLOMAR C. CORALES
Of University of the Philippines Open University appeared in this office/ attend the
Individual interview held at the Barangay Pamarawan, City of Malolos,Bulacan
on March 28-29, 2025. This certification is issued for whatever legal purpose
It may serve.

Prepared by:


ROLDAN M. DAYAO
Barangay Secretary


HON. CESAR S. BARTOLOME
Barangay Captain

DRY SEAL



APPENDIX F Policy Brief



OVERVIEW

Pamarawan Island, a coastal barangay in Malolos City, Bulacan, faces heightened vulnerability to natural disasters due to its geographic location along Manila Bay. The community, largely dependent on fishing, is increasingly exposed to risks which threaten local livelihoods, biodiversity, and the stability of the island itself. With projections indicating that Pamarawan may sink by 2050 due to rising sea levels, residents grapple not only with frequent flooding and power outages but also with the looming threat of displacement and the erosion of their way of life. Corales' study critically examines how Pamarawan residents perceive and respond to disasters, participate in disaster risk reduction activities, and utilize multimedia and ICT-based interventions to reinforce disaster resilience. Using a mixed-methods approach, the study explores the effectiveness of these strategies in a context marked by limited resources and geographic isolation. The research highlights the persistent challenges of educational disruption, inadequate infrastructure, and uneven access to technology, all of which shape the community's capacity for resilience. By situating disaster resilience within the lived experiences of Pamarawan's residents, the study provides a nuanced understanding of how localized, ICT-supported approaches can contribute to disaster justice and inform future DRRM initiatives for similarly vulnerable coastal communities.

KEY POINTS

- Geographic isolation and limited use of available technologies reveal a gap between exposure to ICT and its actual adoption for disaster resilience.
- There is a strong link between awareness and use of multimedia tools and residents' participation in DRRM activities was observed among sixty-five (65) residents of Pamarawan.
- Multimedia interventions increase the likelihood of community engagement in disaster risk reduction programs.
- Compliance-oriented DRRM planning may overlook the specific needs and resource gaps of isolated coastal communities like Pamarawan.

CHALLENGES

1. Economic Vulnerability

The community's livelihood heavily depends on fishing, which is disrupted during disasters like flooding and typhoons, leading to income loss and food insecurity. This economic fragility limits residents' capacity to invest in resilience-building activities or infrastructure improvements

2. Inadequate Critical Facilities

The island lacks sufficient firemen, emergency equipment, and structurally sound housing, increasing risks during disasters such as fires and floods. Power outages frequently occur, further hampering communication and emergency response

3. Limited ICT Adaptation & Communication Gaps

The island lacks sufficient firemen, emergency equipment, and structurally sound housing, increasing risks during disasters such as fires and floods. Power outages frequently occur, further hampering communication and emergency response.

4. Environmental Threats & Climate Change

Rising sea levels, ongoing reclamation projects, and loss of mangrove ecosystems increase the island's vulnerability to flooding and displacement. These environmental changes exacerbate existing risks and threaten the community's long-term sustainability.

These findings are from Corales' 2025 study entitled Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT Based Management in Pamarawan Island, Malolos City

POLICY RECOMMENDATIONS

1. Localize DRRM Plans

In pursuit of a more comprehensive resolution on paper, policymakers should look into existing DRRM policies and pursue inclusion of protocols for underserved and geographically isolated locations across the country to avoid the probability of ensuing compliance-oriented planning and minimize potential risks as originally intended

2. Benchmarking of Localized Knowledge

Coastal residents' knowledge concerning disasters vary depending on their experiences. To strengthen archival of place-based knowledge and support towards coastal residents, the local government unit should regularly conduct discussions with concerned residents to restore communication and complement the action plan with their involvement to ensure problems will be resolved with full attention.

3. Invest in Disaster Resilience

To sustain progress towards collaborative infrastructural projects, the local government unit should also look into investing in disaster resilience, as synonymously advocated by the United Nations' 2025 Global Assessment Report on Disaster Risk Reduction.

4. Financing ICT-for-DRRM Equipment

To alleviate communication gaps, the local government unit should also invest in up-to-date ICT tools that could further aid multimedia in complementing the DRRM protocols of the coastal communities.

These findings are from Corales' 2025 study entitled Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT Based Management in Pamarawan Island, Malolos City

POLICY RECOMMENDATIONS

5. Produce Multimedia-based Interventions

The local government unit should also invest in up-to-date ICT tools that could further amplify the presence of multimedia in complementing the DRRM protocols of the coastal communities, as well as partner with other telecommunications providers to stabilize the residents' access to stable cell reception and Internet connection.

6. Utilize Renewable Energy (Solar)

To make the community self-sustaining in terms of electricity access, the local government unit must also spearhead discussions concerning the pursuit of solar-powered communities with Meralco and other partners, partaking in the campaign towards investment and reliability in renewable energy.

7. Regulate Nature-based Projects

To reduce ecological risks, the local government unit and Department of Environment and Natural Resources (DENR) should reassess the appropriateness and the progress of nature-based projects such as mangrove planting projects for the past years and minimize waste across Manila Bay through joint government efforts.

8. Collaborate with Academe & STEM

To further utilize academe-government relations, the local government unit (LGU) and STEM professionals should explore how to innovate climate-smart and nature-based resolutions towards land erosion, sea level rise, flooding, etc.

These findings are from Corales' 2025 study entitled Sailing Across Brackish Waters: An Exploratory Sequential Mixed-Method Study Situating Disaster Resilience through ICT Based Management in Pamarawan Island, Malolos City