



Riding the TIDES: Community Health Adaptation to Flooding in Bulacan

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ABSTRACT

Background: Flooding represents more than an environmental issue; it poses a profound threat to livelihoods and psychological well-being. For families living in chronically flood-prone areas, it has become a constant fight for survival. **Purpose:** Although previous studies have examined flood adaptation and disaster resilience, limited research has explored how residents themselves perceive, experience, and adapt to flood-related health challenges through their own visual narratives. To address this gap, this study sought to explore the community health adaptation strategies of barangay residents, the challenges they face, and their aspirations for a healthier, more resilient future. **Methods:** Using a qualitative photovoice design, 17 purposively selected flood-affected residents documented lived experiences through photographs discussed in semi-structured interviews and focus group discussions. Data underwent inductive thematic analysis. Trustworthiness was ensured through member checking, triangulation, reflexivity, audit trails, and peer debriefing, and code-recoding procedures. **Results:** The core theme, Riding the TIDES, captured the dynamic process of adapting, persevering, and striving toward resilience amidst flooding. Five themes emerged: (1) Trussed Boundaries of Inundation, (2) Iterative Pathways of Acclimatization, (3) Dialogues of Meaning-Making, (4) Emerging Consciousness of Needs and Aspirations, and (5) Shared Agency and Sustained Solidarity. **Conclusion:** The findings reveal that adaptation to chronic flooding transcends physical survival and encompasses resilience-building, meaning-making, and collective empowerment. The study contributes a participant-driven understanding of how chronic flood exposure fosters a nuanced form of toxic resilience, in which adaptive capacities coexist with enduring structural vulnerabilities and aspirations for systemic change.

KEYWORDS

Flooding, Community health adaptation, Photovoice, Resilience, Disaster preparedness

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1. BACKGROUND

Flooding has emerged as a persistent and destructive environmental threat to humanity, growing more frequent and severe year after year. It has caused far more

than an occasional inconvenience, imposing a substantial burden on families living in chronically flood-prone areas. Vulnerable communities often repeatedly endure grave repercussions such as the loss of homes,

livelihoods, and even life. In the face of these relentless challenges, community health adaptation is not optional; it is a must for survival.

Nowadays, flooding is nearly ubiquitous; it is recognized as the world's most common natural disaster ([United Nations \[UN\]](#), 2025). The UN Office for Disaster Risk Reduction's ([UNDRR](#), 2025) Global Assessment Report for 2025 revealed that the number of documented flood-related disasters has surged by 134% since 2000, compared with the previous two decades. Flooding disproportionately troubles developing nations ([Phouratsamay et al.](#), 2024). For such countries, flooding is not simply an environmental issue but rather a repetitive negotiation with uncertainty.

Climate change is the primary driver of the increasing frequency and intensity of floods. It brings warmer global temperatures, extreme precipitation, and rising sea levels, leaving many coastal regions particularly susceptible to serious flooding ([ActionAid UK](#), 2025). The Philippines, an archipelagic nation situated along the Pacific typhoon belt, exemplifies this vulnerability, having consistently ranked as the country with the highest disaster risk since 2008 ([Bündnis Entwicklung Hilft](#), 2025). The Department of Environment and

Natural Resources – Mines and Geosciences Bureau (DENR-MGB) named Bulacan as one of the top 10 flood-prone provinces in the Philippines ([Climate Change Commission & DENR](#), 2023). Bulacan, in particular, has gained notoriety for having the highest number of flood control projects and the highest total contract cost among project deals (GMA Integrated News Research, 2025). Despite these astronomical investments, Bulacan continues to face worsening floods, one after another. The Commission on Audit later identified about ₱344 million worth of flood control projects in Bulacan as either “ghost” or constructed elsewhere ([Panti](#), 2025).

This then leaves flooding as a significant danger to public health and safety. Mortality in flood disasters typically results from accidents in the form of drowning, physical trauma, and electrocution ([Dimitrić et al.](#), 2021). Floodwaters can also serve as breeding grounds for communicable diseases. Waterborne diseases such as typhoid fever, cholera, and leptospirosis can be acquired through exposure to contaminated water. On the other hand, stagnant waters allow the spread of vector-borne diseases such as dengue and yellow fever ([Philippine Council for Health Research and Development](#),

2022). Moreover, flood disasters have mental health consequences and can be traumatic experiences (Heanoy & Brown, 2024).

Facing recurrent floods, Filipinos have learned to take matters into their own hands in order to survive. Living in a country where floods are a routine part of life, they have become instinctively self-reliant and developed their own ways to cope with flood disasters (Harvard Humanitarian Initiative Program on Resilient Communities [HHI RC], 2024). Over time, this constant exposure has fostered a culture of resilience, with Filipinos adapting to their flooding predicament not only out of necessity but as an ingrained way of life. Nevertheless, existing flood-related literature has mainly focused on the diseases brought by flooding. While these studies are imperative for documenting the burden of inundation, they underrepresent the proactive agency that communities exercise to mitigate the risks of flooding. Additionally, the majority of past research efforts relied on quantitative designs, failing to gather insights into the experiential dimension of community health adaptation. Albeit an undeniably admirable trait, Filipino resiliency can be dangerous because it tends to carry the expectation that people should deal

with hardship alone. This mindset overshadows the need for social action and perpetuates a cycle where communities are left to fend for themselves (Lagon, 2024).

Previous studies have extensively examined flooding and disaster resilience, particularly through quantitative assessments of flood-related health outcomes. Nevertheless, exploration on how residents themselves perceive, experience, and adapt to flood-related health challenges remains limited. Photovoice is particularly well-suited to addressing this gap, as it enables residents to visually document and articulate experiences that may not be fully captured by conventional approaches. Understanding how residents adapt to the health challenges posed by recurrent flooding requires examining both individual and community responses to adversity. Hence, this study was conceptually informed by Roy's Adaptation Model (1976), Norris et al.'s Community Resilience Theory (2008), and an interpretivist perspective, which collectively guided the exploration of adaptation, resilience, and meaning-making among flood-affected residents.

To capture the reality of living in habitually flooded areas, the researchers intended to conduct an in-depth exploration

of community health adaptation practices in flood-prone barangays of Bulacan. This study used photovoice, a relatively new approach not previously applied in this context, to provide researchers with a direct view of residents' perspectives. Beyond capturing experiences, the goal of photovoice is to empower participants and advocate for social change. Data generated by photovoice on the local health behaviors and needs will help guide the development of holistic, sustainable, and culturally sensitive health promotion and disaster readiness programs. The findings will inform current flood management initiatives by highlighting community-based coping strategies, thereby supporting policies and interventions that are shaped by the firsthand experiences of flood-affected populations. Consistent with photovoice's goal of communicating community perspectives to policymakers, the study findings and participant-generated photographs were shared with relevant barangay and municipal officials.

2. METHODS

Design

This study adopted a participatory qualitative research design situated within an interpretivist paradigm, using photovoice

as the specific data-generation method. The participants are empowered to capture and interpret images that represent their lived realities and catalyze social action (Schwartz, 1989; Wang & Burris, 1997; Wang & Redwood-Jones, 2001). Mooney and Bhui (2023) further support this approach as it allows the participants to express what might be difficult to convey verbally (i.e., emotions, creative insights, subconscious thoughts). This bridges the usual gap between stakeholders because the participants themselves choose what photos to show and how to interpret them based on guiding questions formulated by the researchers.

Participants and Setting

The participants were recruited using purposive criterion sampling. Eligibility criteria included being Filipino-speaking, at least 18 years old, residing in a flood-prone barangay for at least one year, and having access to a camera or mobile phone. Individuals who were transient residents and had lived in the community for less than one year were excluded from the study to ensure that participants possessed sufficient experience and understanding of local flooding conditions and could accurately articulate their experiences. In

employing a photovoice approach, a sample of seven to 10 participants is often sufficient (Hatzikiriakidis, 2023). Accordingly, this study initially recruited 10 participants for individual interviews and five additional participants for focus group discussions (FGDs). As data collection and preliminary analysis progressed, two additional participants were recruited for the individual interviews to verify data saturation. No additional participants were required for the

FGDs, as the discussions reinforced the themes identified during the interviews without generating new information. Data collection concluded since no unique insights emerged across the interview and FGD data (Naeem et al., 2024). The study was conducted in selected flood-prone barangays identified as "high risk" through hazard maps from the Provincial Disaster Risk Reduction and Management Office (PDRRMO, 2022).

Table 1. Demographic profile of the participants

Pseudonym	Age	Sex	Education Level	Occupation	Length of Residence (in years)	Flood Frequency	Flood Depth
Tina	47	F	ALS Graduate	Manicurist/ Sari-sari store owner	17	Frequent	Knee
Rhen	30	F	High School Graduate	Barangay volunteer	25	Frequent	Knee
Teresa	64	F	Elementary Graduate	None	64	Frequent	Leg
Felicity	34	M	College Graduate	Barangay Training and Employment Coordinator	34	Frequent	Thigh
Josie	70	F	Grade 5	None	70	Frequent	Groin
Analyn	55	F	High School Graduate	None	6	Frequent	Knee
Elena	61	F	High School Graduate	Barangay volunteer	61	Frequent	Knee
Flor	50	F	Elementary Graduate	None	50	Frequent	Leg
Louz	56	F	Grade 5	Barangay volunteer	56	Frequent	Thigh
Victoria	58	F	High School Graduate	Vendor	48	Frequent	Leg
Maui	32	F	High School Graduate	Manicurist	8	Frequent	Leg
Maya	52	F	Elementary Graduate	Tailor	24	Frequent	Leg
Rizza	39	F	College Graduate	Barangay treasurer	39	Frequent	Leg
Nestor	54	M	High School Graduate	Barangay councilor	54	Frequent	Knee
Khriel	25	M	College Graduate	Sangguniang Kabataan President	25	Frequent	Knee
Vicente	46	M	High School Graduate	Barangay councilor	46	Frequent	Knee
Sergio	37	M	College Graduate	Barangay councilor	37	Frequent	Leg

Note. Flood frequency is categorized as rare (i.e., once a year or less), occasional (i.e., 2 to 4 times a year), and frequent (i.e., 5 or more times a year or during every rainy season).

Table 1 shows that the 17 participants ranged in age from 25 to 70 years (mean age $\approx$ 47.6 years), with 12 females and 5 males. Participants demonstrated diverse educational backgrounds, ranging from elementary education to college graduates. Their occupations ranged from barangay officials (i.e., councilors, treasurer, volunteers, and Sangguniang Kabataan [SK] President) to small business owners (e.g., sari-sari store owners, manicurists), vendors, and some who were unemployed. Length of residence in the barangay ranged from 6 to 70 years, reflecting deep community ties and extensive experience with local flooding conditions. All participants reported experiencing frequent flooding (i.e., 5 or more times per year or during every rainy season), with flood depths ranging from knee to groin level during typical flood events.

Data collection

Data collection involved a photovoice orientation, photo-taking activities, individual semi-structured interviews, and FGDs. The participants were instructed to capture and submit a minimum of five photographs related to their experiences of flooding and community health, without a

maximum number imposed. The residents independently selected five photographs that they considered most meaningful to discuss during the individual interviews and FGDs. The SHOWeD questioning framework was used to facilitate critical reflection on participant-generated photographs (Hatzikiriakidis, 2023). Interviews lasted approximately 30–60 minutes, while FGDs lasted 60–120 minutes. All sessions were audio-recorded and transcribed verbatim. The interviews/FGDs were conducted in Filipino and English. The Filipino transcripts were translated into English by a bilingual researcher, and the translations were subsequently verified by a professional grammarian for accuracy and linguistic consistency. A back-translation/translation-accuracy check was also conducted to ensure that the English translations accurately reflected the original participant responses. Any discrepancies between the visual data and verbal narratives were examined using the participants' explanations during the interviews and FGDs, with the photographs interpreted alongside their accompanying narratives to preserve the residents' intended meanings.

Table 2. SHOWeD questioning framework

SHOWeD	Question
S	What do you see here?
H	What is really happening here?
O	How does this relate to our (your) lives?
We	Why does this problem, concern, or strength exist?
D	What can we do about it?

Note. Adapted from the SHOWeD questioning framework (Hatzikiriakidis, 2023).

Data analysis

Data were analyzed using inductive thematic analysis following the photovoice approach (Wang & Burris, 1997), allowing themes and patterns to emerge from participants' visual and narrative accounts. The researchers began familiarizing themselves with the data by repeatedly examining each photograph and its accompanying narrative. Subsequently, significant statements and visual elements representing essential aspects of the participants' experiences were identified and assigned initial codes. Thereafter, the codes were systematically organized into clusters of related ideas, from which major themes were derived. The researchers developed a rich narrative synthesis integrating the identified themes. All authors participated in the coding process and independently reviewed and evaluated the identified codes and themes as part of triangulation of evaluators. The authors subsequently compared their assessments and discussed discrepancies to reach

consensus and enhance the credibility of the analysis. A core theme was delineated through an iterative review to encapsulate the essential dimensions of the residents' responses to chronic flooding.

Trustworthiness

To ensure rigor and trustworthiness, member checking; pilot interviews; triangulation of methods, sources, and evaluators; peer debriefing; maintaining an audit trail; reflexivity; bracketing; external audits; and code-recoding procedures were implemented.

Ethical consideration

The study was approved by the DYCI Ethics Review Board on March 11, 2026 (Reference: CREDO-EC-CHS-0001). Informed consent and photography release forms authorizing the capture and publication of photographs were obtained from all participants prior to data collection. To protect privacy and anonymity, pseudonyms were used in place of the participants' names. All faces and identifying details in participant-generated photographs were

blurred. Additionally, any third parties or bystanders who appeared incidentally in the participant-generated photographs had their faces and other identifying features blurred to protect their privacy. Audio recordings and photographs were stored in

password-encrypted files, which were kept accessible only to the researchers. Participants retained ownership and copyright of their photographs and granted permission for the images to be reproduced and published in connection with this study.

3. RESULTS

Table 3. Subthemes and initial codes under the major themes of “Riding the TIDES”
(Continue to page 169)

Major Themes	Subthemes	Initial Codes
Trussed Boundaries of Inundation	Loss of Normalcy and Daily Routines	Sudden intrusion of floodwater into homes Temporal disorientation of time-bound activities Restricted mobility within and beyond the home Functional limitations in carrying out basic tasks Interruption of work and educational routines Losing the sense of a stable and predictable daily life
	Environmental Vulnerabilities and Degradation	Interplay between weather patterns and rising sea levels Entrapment within low-lying geographies Man-induced risk exacerbation Depletion of natural protective ecosystems Faulty flood control systems Structural integrity collapse
	Resultant Health Deterioration and Deficits	Heightened susceptibility to infections Post-exposure dermatologic irritation Accidental injuries
	Displacement and Survival Strain	Damaged and misplaced possessions Insecurity among basic commodities Breakdown of utility services Compromised access to healthcare Forced relocation and evacuation pressures Socioeconomic disparities
Iterative Pathways of Acclimatization	Household-Level Structural Adaptations	Physical elevation and safeguarding of household assets Incremental modifications of living spaces Constant repair of damaged physical spaces
	Anticipatory Behavioral Adjustments	Preemptive relocation of personal belongings Resource stockpiling Watchful monitoring of weather and water levels Reworking of schedules around flood patterns Experience-based decision making Seeking refuge
	Health Protection Practices	Activities directed to bolster immune response Utilization of personal protective equipment Reducing contact with floodwaters Immediate personal hygiene and sanitation measures Rapid environmental decontamination

Major Themes	Subthemes	Initial Codes
Dialogues of Meaning-Making	Resource Optimization and Improvisation	Building makeshift walkways Installation of personal drainage systems Repurposing materials for environmental adaptation
	Emotional Responses	Fear centered on loss of home and community Feelings of persistent sadness Accumulated stress and frustration Coping fatigue Growing sense of helplessness Faint silver lining of hope Optimism
	Flooding as the “New Normal”	Compelled accustomization to chronic inundation Acceptance of flooding as an inevitable reality Developing tolerance, resilience, and endurance Simultaneous desire to overcome and transform current situations
	Cognitive and Socio-Behavioral Reframing of Perspectives	Erosion of trust over governance and response systems Institutional neglect and inefficiency Self-reliance as a survival commodity Pragmatic reinterpretation of flooding as a resource Increasing awareness of flood-related repercussions Internalization of a preparedness mindset Prioritization of safety
Emerging Consciousness of Needs and Aspirations	Infrastructure Improvement	Durable flood barriers Improved drainage systems Structurally resilient community spaces
	Access to Health and Safety Resources	Healthcare services Clean water Evacuation centers
	Expectations from Government and Organizations	Faster response Better strategic disaster planning Financial and material assistance
	Vision of an Ideal Community	Stable and secure living conditions Flood-free community Ethical leadership and governance
	Hope for Long-Term Change	Pursuit of sustainable flood mitigation strategies Movement toward long-term community development
Shared Agency and Sustained Solidarity	Collective Action and Bayanihan	Working together to enhance shared spaces Community collaboration in flood preparation and response efforts Informal networks of assistance Sharing of resources Equity-based interventions Engagement in volunteerism and civic action Immediate needs dissemination
	Institutional Support and Dependence	Reliance on external aid Assistance from existing external networks and organizations Sectoral coordination with various administrative levels of government Expectation of continued support from local leaders Community-based surveillance
	Fostering Community Resilience	Flood prevention as a shared responsibility Practice of individual accountability and discipline Communal influence

Table 3 reflects the five major themes describing the lived realities of residents in

chronically flood-prone communities. The findings illuminate the challenges imposed

by recurrent flooding, the adaptive strategies developed by community members, the meanings they attribute to their experiences, their evolving needs and

aspirations, and the collective actions that sustain community resilience amid persistent inundation.

Trussed Boundaries of Inundation

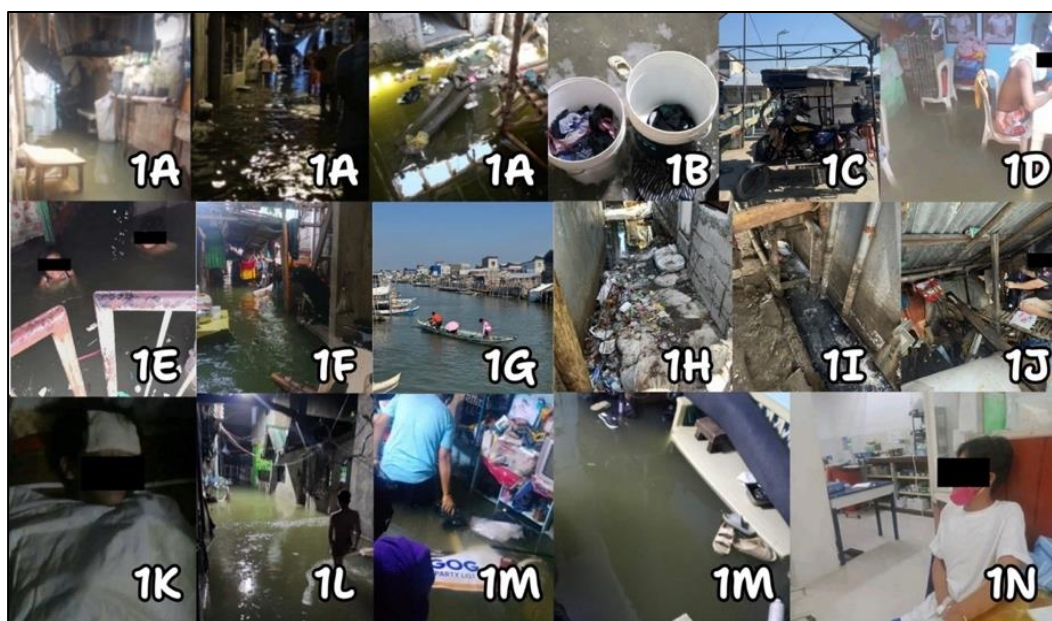


Figure 1. Photovoice outputs under “Trussed Boundaries of Inundation”

The theme explores the restrictive and burdensome conditions imposed by chronic flooding, in which residents are constrained to endure unsafe, unstable, and uncomfortable living conditions.

Loss of Normalcy and Daily Routines

Flooding has repeatedly disrupted everyday household activities and living patterns. It compelled participants to reorganize routines, suspend usual activities, and continually adjust their behavior as ordinary activities became increasingly difficult to sustain amid persistent inundation (Figs. 1A to 1F).

“No matter how much you try to stop it, it really enters on its own. It keeps coming in. It is like an uninvited visitor.”
(Tina, Fig. 1D)

“I was trapped because the water was high; I could not go out. There was still no bridge there, so I could not get out.”
(Josie, Fig. 1F)

“Transportation was the problem. No tricycles were operating. Even those that did operate charged very high fares.”
(Felicity, Fig. 1C)

Environmental Vulnerabilities and Degradation

Some photographs (Figs. 1G to 1I) reflected the residents' perception of habitual flooding stemming from natural geographic conditions, such as low-lying residential areas, and human activities that impaired water flow (e.g., obstructed drainage canals). These images suggested that significant changes with the ecosystem had become embedded within the community landscape, resulting to an exacerbated state of inundation.

"In the drainage canals, people just keep throwing trash. Instead of the floodwater flowing out properly, it consequently gets stuck." (Maui, Fig. 1H)

Resultant Health Deterioration and Deficits

Participant-generated pictures (Figs. 1K to 1L) also revealed how floodwater has made surrounding pathways where community members regularly traversed contaminated. This raised concerns regarding hygiene, sanitation, and exposure to physical hazards. The participants

described how recurrent contact with polluted floodwater increased susceptibility to infections and injuries while simultaneously limiting access to healthcare services and health-promoting living conditions.

"Every day, you have to walk through dirty water. Sometimes, especially if you have a wound, you really should not wade through that kind of water."

(Josie, Fig. 1L)

Displacement and Survival Strain

Several visual accounts (Figs. 1M to 1N) portrayed the uncertainty faced by residents when flooding persists for extended periods. Beyond physical displacement, the photos reflected the emotional and material burdens associated with disrupted living arrangements, resource scarcity, and prolonged exposure to environmental instability.

"We went to the chapel, to the church. We went there because we were afraid. We slept there for a night, maybe two nights." (Teresa, Fig. 1M).

Iterative Pathways of Acclimatization



Figure 2. Photovoice outputs under “Iterative Pathways of Acclimatization”

The theme encompasses the adaptive processes participants adopt in response to severe flooding conditions.

Household-Level Structural Adaptations

The relentless encroachment of floodwaters into homes has prompted residents to consider a gradual approach to modifying and reinforcing their living spaces to minimize the ramifications while still maintaining decent living conditions (Figs. 2A to 2B).

“For us, elevating our belongings is a big help because at least our things are raised, they will not get submerged anymore, and you will not have to buy new ones again. You will not need to keep purchasing replacements.” (Tina, Fig. 2A)

“We already raised our house five years ago. But eventually the water reached it again. Now, we had to raise it once more.” (Louz, Fig. 2B)

Anticipatory Behavioral Adjustments

The recurrent and often unpredictable nature of flooding has shaped a pattern of proactive, experience-informed responses intended to lessen disruption and potential harm before inundation (Figs. 2C to 2E).

“I always look at the calendar so I will know... Because there is a calendar where you can see the timing of when the water rises and when it goes down, so we already know.” (Maui, Fig. 2D)

“We can resolve that situation because we are already used to it. We already know what to do. We are prepared for

whatever may happen; we already know what actions to take.” (Elena, Fig. 2C)

Health Protection Practices

Visual narratives (Figs. 2F to 2G) depicted community residents acquiring deeper adaptive foresight as their focus shifted from solely enacting reactive measures during or after flooding events to taking actual protective practices to reduce existing physical risks associated with prolonged exposure to flooding.

“We have boots, and after wading into floodwater, we apply alcohol. We wipe ourselves down... Because the floodwater is really dirty. But every time we go into the water, we wear boots because of contaminants like rat urine, especially if you have wounds.” (Elena, Fig. 2F)

Dialogues of Meaning-Making



Figure 3. Photovoice outputs under “Dialogues of Meaning-Making”

Resource Optimization and Improvisation

The participants also documented improvised structures and locally developed solutions used to maintain mobility and household functionality during flooding. Figures 2H to 2J demonstrated a pronounced reliance on the creative use of available resources in ways that preserve both utility and livability.

“When the water starts to rise, we make bamboo bridges like that... So even as the flood keeps getting higher, we keep finding ways and building solutions.” (Flor, Fig. 2H)

“What we did was, since it was hard to drain the water, we made a hole in that small section so the water could pass through there.” (Tina, Fig. 2I).

The theme probes how participants constantly interpret, negotiate, and discern their experiences around interminable flooding.

Emotional Responses

Flooding elicited a wide spectrum of emotional responses, reflecting the broader psychological and affective burden imposed by prolonged environmental instability. [Figures 3A and 3B](#) served as visual reminders of the threats posed by recurrent flooding. It came to be associated with the looming threat of displacement, property destruction, and the gradual erosion of spaces imbued with personal, familial, and communal significance.

“You feel saddened because you start thinking, ‘Will this ever end?’ Every day... It was like this every day; this is the kind of life you are enduring.” (Josie, [Fig. 3A](#))

“If this is completely neglected, especially by the authorities, there will no longer be a Barangay San Roque in the future. We will dissolve like, ah... Candy... In other words, if it is always being watered down, it will melt away, just disappearing suddenly.” (Sergio, [Fig. 3B](#))

Flooding as the “New Normal”

Residents began to perceive flooding not as an isolated phenomenon but as a normalized aspect of their lived realities. [Figure 3C](#) unveiled how inundation has become an ordinary condition around which daily routines and expectations are organized.

“It is like becoming used to it already... Though you cannot really say you have gotten used to it. In a way, you simply do not have a choice. So that becomes the only thing you can do. It just becomes like that. Even if you do not want to get used to it, you have no choice. You just deal with whatever is happening to you, in a way, just going along with the flow.”

(Tina, [Fig. 3C](#))

“And in our town, that kind of situation has already become normalized... It is normal now.” (Maui, [Fig. 3C](#))

Cognitive and Socio-Behavioral Reframing of Perspectives

Repetitive encounters with inundation enabled barangay residents to reassess their priorities, modify their behavioral patterns, and cultivate alternative understandings of their circumstances. The photographs showed how prolonged exposure to flooding led residents to adopt a more

pragmatic outlook on their situation. Community members described becoming increasingly self-reliant, identifying alternative livelihood opportunities, and prioritizing immediate family needs in response to perceived limitations in external support.

“They do not continue the projects into our area; they only improve the roads. In the end, our homes are still left behind...” (Victoria, Fig. 3C)

“In a way, we are left to rely only on ourselves.” (Rhen, Fig. 3E)

“When the floodwaters rise, sometimes we are able to find sources of livelihood... Fishes... Crabs... We are able to gather some...” (Louz, Fig. 3D)

“That is really how I see it because, in the end, your family’s situation should truly be your priority before anything else.” (Tina, Fig. 3E)

Emerging Consciousness of Needs and Aspirations



Figure 4. Photovoice outputs under “Emerging Consciousness of Needs and Aspirations”

This theme captures the participants’ expanding awareness of the needs required to achieve safety, stability, and an improved quality of life during flooding. In this connection, residents reflect on a holistic perception of how experiences with flooding molded their understanding of present difficulties as well as their prospects for future development.

Infrastructure Improvement

As inadequate infrastructure compounds the community’s vulnerability to recurring floods, community members stressed the need for improved facilities. The visual representation (Fig. 4A) mapping out flood-prone roads and poor drainage systems highlighted residents’ strong desire

for safer, more resilient physical environments.

“They should continue elevating the roads and improving the dikes that, as they say, can help prevent the water from rising. Somehow, this could lessen the flooding in our area and allow us to live more comfortably.” (Analyn, [Fig. 4A](#))

Access to Health and Safety Resources

As floodwaters seeped through residential spaces and community areas, many families struggled to maintain proper hygiene and sanitation due to contaminated water sources and limited access to clean water for drinking, bathing, and cleaning ([Fig. 4B](#)).

“Whenever flooding happens, what we really need is food and water because even our water source gets reached by the floodwater, and in case the hose gets affected, we might end up drinking contaminated floodwater.” (Flor, [Fig. 4B](#))

Expectations from Government and Organizations

During flooding episodes, delays in issuing warnings, providing assistance, and implementing interventions often heighten the risks faced by residents, especially those

in highly vulnerable areas. [Figure 4C](#) shows the unmasking of conditions that residents believed required stronger institutional intervention, including flood mitigation measures, emergency assistance, and timely information dissemination.

“They could provide financial assistance or even just fill materials for land elevation. Even if not money anymore, just provide us with materials for filling the area.” (Tina, [Fig. 4C](#))

Vision of an Ideal Community

As residents affected by flooding reflect on their repeated experiences, they envision a community that addresses the ongoing challenges these floods present in their daily lives ([Figs. 4D to 4E](#)).

“Going to work without getting wet, and it feels happier to walk when everything is dry... The roads are dry.” (Tina, [Fig. 4D](#))

“If only solutions could be made, we hope we could live more normally and no longer experience flooding like that.” (Analyn, [Fig. 4E](#))

Hope for Long-Term Change

More than short-term coping strategies, participants likewise longed for a community supported by sustainable flood mitigation efforts that could significantly

reduce risk and protect residents in the long run (Fig. 4F).

“It would be better if our barangay had its own water supply.” (Victoria, Fig. 4F)

“Maybe we should all work together. For example, we can encourage our fellow

barangay residents to help clean the canals so water can flow directly and no longer remain on the roads.” (Elena, Fig. 4F)

Shared Agency and Sustained Solidarity



Figure 5. Photovoice outputs under “Shared Agency and Sustained Solidarity”

This theme provides a comprehensive view of the mechanisms by which communities reclaim control over their environment and address the health issues resulting from flooding.

Collective Action and Bayanihan

The participants embody a localized form of communal agency in which residents set aside individual limitations to form a united front against the recurrent impacts of flooding. Portraits under Figures 5A to 5E illuminated bayanihan as a community-

based mechanism used to address challenges that exceeded individual capacities and foster mutual support during times of uncertainty.

“We just help each other out so that somehow we can... Help those in our community, our fellow barangay members.” (Felicity, Fig. 5A)

Institutional Support and Dependence

Flood-prone areas also rely on coordination with administrative bodies to manage large-scale environmental risks that

exceed local capacities. Participant-generated photos (Fig. 5F to 5H) signify interactions between residents and local authorities amid flooding episodes.

“Really... Really, there is a connection between the barangay council and the municipal council, and we truly have a connection with each other.” (Nestor, Fig. 5H)

“Actually, the councilors went around, the councilors went around during that time even though the flood was really high... We went around the neighborhood to check on them... Then check what the needs are, what the captain should do, which the captain did afterward.” (Felicity, Fig. 5H)

Fostering Community Resilience

Community residents emphasized environmental responsibility, knowledge sharing, and collective preparedness as ways to strengthen long-term resilience. Images 5I and 5J reflected ongoing efforts to foster resilience through shared action with neighboring areas and stewardship of the local environment.

“It should be that each one in the community... They should take care of their trash so that such things won't happen. Clean up the canals and the dirty surroundings.” (Analyn, Fig. 5I)

“In other words, we exchange ideas with them. As we improve, Barangay San Roque can also adopt our practices to enhance their own community. This way, they can achieve success in their barangay as well.” (Sergio, Fig. 5J)

Riding the TIDES



Figure 6. Illustration of the core theme “Riding the TIDES”

Figure 6 illustrates the core theme, *Riding the TIDES*, which encapsulates the dynamic process through which residents of flood-prone communities navigate, adapt to, and persevere amid recurrent inundation.

The darkened floodwaters symbolize the *Trussed Boundaries of Inundation*. It mirrors the constraints, vulnerabilities, and disruptions associated with chronic flooding, while the anchored boat represents the burdens that hinder recovery and adaptation. At the center, the bamboo boat navigating unstable waters reflects the *Iterative Pathways of Acclimatization*, where residents constantly made efforts to adjust, cope, and endure amidst changing environmental conditions. The facial expressions of individuals aboard the boat engage in *Dialogues of Meaning-Making*, illuminating the emotional and cognitive processes by which residents interpret and assign meaning to their experiences. In contrast, the brighter landscape represents the *Emerging Consciousness of Needs and Aspirations* for safer living conditions, resilient infrastructure, accessible services, and improved community well-being. Finally, the synchronized paddling of the residents signifies *Shared Agency and Sustained Solidarity*, detailing the very essence of

collective resilience, mutual support, and shared responsibility in responding to flooding.

Together, the transition from darkness to light reflects the movement from present adversities toward future possibilities. *Riding the TIDES*, therefore, emblemizes their ongoing journey of navigating challenges, much like travelers steering a boat through unpredictable waters. Although they cannot stop the floods, they learn how to adjust, survive, and move forward.

4. DISCUSSION

Using photovoice, this study examined the experiences of residents from flood-prone barangays in Bulacan and identified five major themes and 19 subthemes that collectively illustrate how communities experience, interpret, and respond to recurrent flooding.

The first major theme, *Trussed Boundaries of Inundation*, captures the restrictive effects of recurrent flooding on everyday life. The participants described disruptions in mobility, household activities, education, and livelihood, suggesting that chronic inundation destabilizes daily routines and undermines perceptions of normal living conditions. Similar findings

have been reported among flood-prone communities where environmental and infrastructural deficiencies continuously disrupt social functioning and quality of life (Aguilar, 2021; Ugorji et al., 2025). The participants also identified low-lying geographical conditions, environmental degradation, and inadequate flood-control structures as contributors to worsening flood conditions, supporting previous evidence that environmental vulnerabilities intensify community exposure to flooding (Namayi et al., 2025). Habitual inundation also exposed community members to infections, injuries, displacement, and healthcare disruptions, reinforcing its significance as a public health concern (De Guzman et al., 2025; Quinn et al., 2023).

Despite these challenges, barangay residents developed adaptive responses that formed the second major theme, *Iterative Pathways of Acclimatization*. Adaptation emerged as a continuous process shaped by repeated exposure to flooding and accumulated local knowledge. The participants employed structural modifications, anticipatory preparedness behaviors, health-protective practices, and resource improvisation to reduce vulnerability and maintain daily functioning. Similar adaptive strategies have been

documented among flood-prone communities where permanent infrastructural solutions remain inaccessible (De Guzman et al., 2025; Mangansat, 2025; Namayi et al., 2025; Turner et al., 2025; Ugorji et al., 2025).

The third major theme, *Dialogues of Meaning-Making*, features the emotional and cognitive processes through which local stakeholders interpreted their experiences with chronic flooding. The participants described feelings of fear, frustration, helplessness, and emotional exhaustion, echoing findings that repeated disaster exposure significantly affects psychological well-being (El-Mousawi et al., 2024). At the same time, residents demonstrated hopefulness and a growing capacity to adapt, eventually coming to view flooding as a “new normal.” While normalization facilitated coping, it also reflected what was described as toxic resilience, in which persistent hardship is accepted as inevitable despite ongoing structural vulnerabilities (Lagon, 2024). Nevertheless, community members continued to express aspirations for change, suggesting that adaptation reflected ongoing negotiation between endurance and hope. Residents’ self-reliance should not be accepted as evidence of resilience. Although it demonstrates

adaptive capacity, its persistence may also signal the normalization of structural inadequacies. When communities repeatedly compensate for deficient infrastructure, limited services, or delayed institutional responses through their own resources, resilience may inadvertently shift responsibility for disaster risk from institutions to those already experiencing vulnerability. In this sense, adaptation becomes double-edged; it enables residents to survive recurrent flooding while potentially allowing the conditions that necessitate such adaptation to persist. The participants' simultaneous reliance on self-help and continued expectations of government support suggest that community resilience does not eliminate structural responsibility; rather, it stresses the need for institutions to complement community capacities with sustainable infrastructure, accessible health services, and responsive disaster governance.

The findings also revealed shifts in residents' perceptions, priorities, and expectations, giving rise to the fourth major theme, *Emerging Consciousness of Needs and Aspirations*. The participants identified the need for resilient infrastructure, accessible healthcare services, clean water systems, responsive governance, and sustainable

flood mitigation measures. Deficiencies in institutional support and infrastructure constrain adaptation efforts and increase vulnerability (Dulawan et al., 2024; Namayi et al., 2025). Beyond immediate concerns, participants envisioned safer and more resilient communities, reflecting aspirations for long-term improvement.

Finally, *Shared Agency and Sustained Solidarity* underscore the importance of collective action in sustaining community resilience. Barangay residents emphasized collaboration, resource sharing, volunteerism, and bayanihan as essential mechanisms for coping with recurrent flooding. Social capital and community networks strengthened resilience by facilitating mutual support and coordinated responses (McKie & Aitken, 2025). Participants likewise stressed the importance of local government and organizational support in complementing community-led resilience efforts (Ciamei & Hollekamp, 2025).

The findings support the theoretical framework of both Roy and Norris et al. by demonstrating that adaptation to flooding occurs across interconnected individual and communal systems. Overall, the findings suggest that chronic flooding is not solely an environmental concern but a

multidimensional public health issue that requires holistic interventions. Sustainable responses should therefore extend beyond disaster relief and prioritize community resilience, adaptive capacity building, environmental management, and stronger partnerships between communities and institutions.

5. CONCLUSIONS

Flooding is not merely an environmental phenomenon but a persistent and deeply disruptive reality that reshapes the lives of residents in flood-prone barangays. Capturing the lived experiences of community members through photovoice allowed this study to contribute to community health nursing knowledge by offering a participant-driven understanding of how adaptation unfolds amid persistent inundation, providing insights to inform more context-sensitive nursing practice and disaster resilience initiatives. To continuously endure chronic flooding speaks volumes of the instability, exhaustion, and uncertainty that residents are compelled to face in their everyday lives. The experience of flooding transcends physical disruption, altering residents' routines, emotional well-being, relationships, and overall sense of security.

While some individuals gradually learn to adapt, others continue to struggle with the cumulative burdens brought about by recurring floods.

Residents are in dire need of stronger institutional support, accessible healthcare services, safer infrastructure, and sustainable disaster preparedness interventions that can help them navigate the ongoing challenges of flooding. Addressing these challenges requires community health nursing interventions that extend beyond emergency response to encompass health promotion, disaster preparedness, community empowerment, and sustained partnerships with local governments and other stakeholders.

The journey of residents living in flood-prone communities is not linear, as they may move back and forth between exhaustion and perseverance, frustration and acceptance, vulnerability and resilience. Nevertheless, amidst the relentless tides of inundation, residents continue to rise each time the waters pull them under, reflecting a resilience that has long characterized Filipino communities. Yet, their capacity to endure should never diminish the collective responsibility to provide the support, resources, and responsive governance needed for communities not merely to

survive chronic flooding, but to thrive despite it.

Based on the research findings, several strategic measures are recommended to strengthen community resilience against recurrent flooding. In nursing practice, it is necessary to conduct public health education campaigns on flood-related diseases, sanitation, and hygiene, as well as disaster preparedness training for healthcare workers and community volunteers. Nurses are also expected to provide empathetic psychosocial support and develop comprehensive care continuity plans, including the use of telehealth to reach isolated areas. Regarding nursing education, institutions are encouraged to integrate disaster simulations, drills, and community immersion programs into their curricula. For nursing research, further studies should explore the experiences of other vulnerable populations, such as children, the elderly, people with disabilities, and indigenous communities, and employ longitudinal designs to understand how adaptation and resilience strategies evolve. Finally, from a public health perspective, primordial prevention strategies need to be reinforced through sustainable land-use practices, proper waste management, and climate-resilient urban planning, as well as

cross-sector collaboration among healthcare professionals, local governments, and policymakers to enhance flood mitigation programs and healthcare accessibility.

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AUTHOR CONTRIBUTIONS

AJCT contributed to Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Writing - Original Draft, and

Writing - Review and Editing. RDJ contributed to Conceptualization, Methodology, Supervision, and Writing - Review and Editing. SJLQ contributed to Data curation, Formal analysis, Investigation, and Validation. TAPN contributed to Data curation, Formal analysis, and Investigation. CMP contributed to Data curation, Formal analysis, Investigation, and Visualization.

CONFLICT OF INTEREST

The authors have no competing interests associated with the material presented in this paper.

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DATA AVAILABILITY

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

DECLARATION OF USE OF AI

During the preparation of this work, the authors used Grammarly to assist with language and grammar editing. The authors reviewed and edited the content as needed

and take full responsibility for the manuscript

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