Cultural Risk Communication Framework: The Case of a Riverine Community in Infanta, Quezon, Philippines

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Asian Journal of Agriculture and Development (AJAD)
Vol. 22 No. 1 June 2025

ABSTRACT

Natural hazards pose insurmountable challenges to sustainable human development because they shake the structure of social systems and the built environment. Contemporary studies in the "hard" sciences, commonly known as the scientific-technical or technocratic perspectives, have dominated the disaster risk literature, which posit that risk is quantifiable and objective. Contrary to existing literature, risk is not a neutral concept. Disasters are socially and culturally constructed and perceived by different people differently. This paper highlights the value of integrating different social actors' socio-cultural constructions in disaster risk communication. To explore the characteristics of the riverine community, the communication channels and strategies for disaster risk communication, and the community's constructions of risk, this study employed purposeful sampling from 38 research participants using focus group discussions and key informant interviews to gather data. While information from media and early warning signals are important sources of disaster information, the community heavily relies on local forecasting as a metric for disaster risk. For a community that depends heavily on agriculture for livelihood, being aware of and acknowledging risk is the first step to preventing disasters. In sum, disaster risk communication must consider the underlying socio-cultural factors influencing the community's construction of risk.

Keywords: disaster, risk communication, communication framework, riverine community
JEL codes: Q54, Z10

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INTRODUCTION

Disasters and climate variability are among the major challenges facing sustainable human development. Since the 1980s, environmental hazards worldwide have increased sharply as measured in lives lost, displaced people, and financial costs. Out of 25 percent of the world's gross domestic product, Asia and the Pacific accounted for 38 percent of the economic losses due to calamities during 1980–2009 (ADB 2013). While frequent and extreme weather events direly impact on the social and economic activities of affected communities (Sarker et al. 2019), environmental hazards are increasingly affecting riverine and coastal communities (Wong and Abdullah 2022).

Integrating and mainstreaming disaster information have become an essential part of aid. Disaster-affected people need information as much as water, food, medicine, or shelter, considering extreme weather events. Given this, communication is an important part of disaster prevention and management and public risk awareness. Information received via newspapers, television, radio, and, increasingly, the internet before, during, and after a disaster are essential. Mass media have advantages in disaster communication. The public can easily access them, and they remain working even in cases of a partial breakdown of infrastructure (Peters 2009). Hence, communication strategies and the rapid, widespread dissemination of early warnings can prevent the impinging impact of disasters.

Although various studies (Landeros-Mugica, Urbina-Soria, and Alcantara-Ayala 2016; Su, Zhao, and Tan 2015; Zakaria and Mustaffa 2014) found that risk communication and public awareness play a significant role in disaster preparedness and mitigation to reduce disaster impacts, environmental researchers and disaster managers have often failed to recognize that disasters are socially constructed and experienced differently by different communities. This generates a plurality of interpretations for understanding disasters. Recognizing this multiplicity is crucial to understanding how riverine communities construct the social and cultural narratives of disaster risk.

The public does not see risks in the same way as the experts. The gap between layman and expert opinions has given rise to a whole new sub-branch of the psychology of risk, a new sub-discipline for communicating about and labelling risks, and a whole industry for cataloging them (Douglas 1992). Highlighting this dichotomy is important to understand what makes people occupy vulnerable areas. Technical experts often implicitly and sometimes explicitly assign equal weight to hazards that take many lives at one time and hazards that take many lives over some time. For technical experts, risk is expressed in quantitative terms using computational and experimental methods to identify, estimate, and evaluate the risks. Non-experts, however, typically assign greater weight to hazards that take many lives at one time (e.g., catastrophes). They express risks in qualitative terms and use intuitive and impressionistic methods to identify, estimate, and evaluate the risks (Covello 1983).

This study describes the characteristics of a riverine community in Infanta, Quezon, Philippines as a homogenous ecological unit by undertaking textual analysis of data from secondary sources and thematic analysis of transcriptions from focus group discussions (FGDs) and key informant interviews (KIIs). Thematic analyses from FGDs and KIIs were applied to identify the communication channels and strategies in disaster risk management as well as the community's socio-cultural construction of risk.

Framing Disasters

Disasters have become a buzzword for many contemporary multidisciplinary and cross-disciplinary studies in the past decades. According to Hoffman and Oliver-Smith (2002), the word "disaster" is often frequently associated with a wide array of contemporary problems, encompassing every aspect of human life—social, economic, and political.

Disasters, often seen as natural events like earthquakes, hurricanes, or floods are not purely "natural" in the way laypersons typically think. It is generally accepted among environmental geographers that disasters are deeply influenced by social factors in every aspect of a disaster—causes, vulnerability, preparedness, results and response, and reconstruction (Smith 2006). By classifying disasters based on their causes, researchers in the "hard" sciences have built a significant impact on how disasters are conceptualized, creating a technocratic perspective of disaster (Aragón-Durand 2009).

Disasters are social phenomena caused by the actualization of risks (Mulvany 2011) and occur when a community suffers exceptional levels of disruption and loss (Smith 2009). An environmental hazard such as flooding, earthquake, and volcanic eruption becomes a disaster when the hazard reveals social vulnerability, causing damage to both the physical and social fabric of an environment that exceeds the ability of an affected community to recover without assistance (Etkin and Dore 2003). Disasters, therefore, happen when a community is overwhelmed and unable to resist shock, causing significant damage to the lives of its people and requiring external aid to recover from the loss.

Smith (2009) outlined a more organized attempt to limit the damaging effects of environmental hazards, an approach that led to the four environmental hazard paradigms (Table 1).

While the types of danger may be similar throughout the world (Smith 2009), and despite advances in knowledge and technology (e.g., satellite coverage or surveillance techniques), vulnerability to and the risks from hazards have been rising in developing countries—and this may be the case even with the frequency and magnitude of hazard events remaining constant. In other words, what may have been increasing is not the number of disasters because of environmental hazard events per se, but the impacts of these events on people and property (Dekens 2007).

Table 1. The evolution of environmental hazard paradigms

Period	Paradigm	Main Issues	Main Responses
Pre-1950	Engineering	What are the physical causes for the magnitude and frequency of natural hazards at certain sites and how can protection be provided against the most damaging consequences?	Scientific weather forecasting and large structures designed and built to defend against natural hazards, especially those of hydro-meteorological origin
1950–70	Behavioral	Why do natural hazards create deaths and economic damage in the more developed countries (MDCs) and how can changes in human behavior minimize risk?	Improved short-term warning and better longer-term land planning so that humans can avoid the sites most prone to natural hazards
1970–90	Development	Why do people in the least developed countries (LDCs) suffer so severely in natural disasters and what are the historical and current socioeconomic causes of the situation?	Greater awareness of human vulnerability to disaster and an understanding of how low economic development and political dependency contribute to vulnerability
1991 and above	Complexity	How can disaster impacts be reduced in a sustainable way in the future, especially for the poorest people in a rapidly changing world?	More emphasis on the complicated interactions between nature and society, leading to the improved long-term management of hazards according to local needs

Source: Smith (2009)

Disaster Risk Communication

Communication sources in disasters

Communication is one of the most indispensable components in 21st century society. Almost all social actors rely on various communication sources to be updated about their social surroundings. This is because communication is important to human behavior and actions and is central to all human and social development initiatives. When people are stricken by a disaster, they need clarity and certainty of information, including information on events, ways to save themselves, and the anticipation of aftershocks and evacuation locations through integrated communication from authorities (Fadhliah et al. 2022). It is, therefore, important to consider every aspect of how people are getting risk information, especially in situations like disaster risks.

Fadhliah et al. (2022) emphasized the importance of information systems and content in disseminating information to control panic and chaos in communities impacted by environmental hazards. In such situations, mainstream channels such as TV and radio are considered important mechanisms for receiving and interpreting messages that these became a primary, if not sole, source of information for the public about science and risk information (Hanson-Easey et al. 2018; Brossard and Nisbet 2007). Thus, media are a conduit of how issues are socially constructed and contribute to a cultural cognition of risk (DiMaggio 1997). Research suggests that when people know something about a risk (i.e., via the media), they conceptualize and construct distinctive forms of causation, agency, and uncertainty, which can result in oversimplifying, attributing causation, associating agency, or presenting uncertainty (Jasanoff 1999). Therefore, issues of causation, agency, and uncertainty are often the strategic communication devices used by journalists and other communicators to convey the aspects of risks (Akin 2015).

FAO (2010) found that rural radio is one of the most widespread, accessible, and versatile communication tools used in developing countries. It rapidly disseminates critical information and early warning, generates local contents, improves coordination and awareness, and facilitates participatory approaches. Radio is particularly useful in isolated areas as it spreads critical information about emergencies and environmental risks. Moreover, it may encourage participatory communication when it involves a two-way process where communities actively participate in planning and producing radio broadcasts; and it facilitates the exchange of views, helps build a sense of community, and enhances the value of local knowledge (Mycoo 2015).

Meanwhile, public communication such as public awareness campaigns includes public service announcements (PSAs); print materials (e.g., brochures, calendars, and newsletters); electronic educational materials on government websites, social media, and billboards (Ratnapradipa 2014). These constitute another channel for disseminating warning signals and risk information.

Rural communication strategies foster local flavor in packaging risk messages. Indigenous forms of communication including musical concerts, theater, dance, and visual arts in rural coastal communities can be further supplemented by participatory videos and mapping to assist local people to visualize and understand environmental messages (Mycoo 2015). Regan (2007), as cited by Mycoo (2015), argued that one-way, written, or verbal communication is less effective in enabling learning and active engagement than dialogue and interactive forms of face-to-face communication.

Bridging the Gap through Risk Communication

Integral to science communication is risk communication, which has been a subject of academic study in the past 35 years. Initially, research in this area aimed to translate risk assessments into messages for the public to align their views with expert opinion and to facilitate understanding on the part of non-experts (Frewer and Fischer 2014). Apparently, a layperson's judgment of risk tends to

be related to other hazard characteristics such as the catastrophic potential and the threat to future generations (Slovic 1987). Conversely, there are measurable differences in how technical experts and citizen stakeholders define and assess risk.

In the context of disaster risk communication, risk messages are likely to be ineffective when they simply disseminate factual, "expert views" without consideration for what the audience wants to know and the kinds of existing resources communities can harness to ameliorate their risk. An interactive or participatory model of risk communication better suits constructing and disseminating meaningful risk messages (Hanson-Easey et al. 2018). While technical analysis is vital for making risk decisions better informed, more consistent, and more accountable, such analysis cannot easily reduce value conflicts and pervasive distrust in risk management. Trying to address risk controversies primarily with more science is likely to exacerbate conflict (Slovic 2001). These findings are useful in informing policymakers and decision-makers on communication strategies that may enhance knowledge sharing and awareness building of disaster risk reduction and management (DRRM). They are equally important in understanding how to integrate risk construction at the individual or community levels.

Risk communication was developed to address the gap in the knowledge of technical topics between experts and the public. It can help people with differing perspectives and levels of expertise to share a common understanding of the level of risk (actual danger) involved in a particular activity (Beecher et al. 2005). The National Academy of Sciences, as cited by Covello et al. (2001), defines risk communication as "an interactive process of exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management."

Through the years, risk communication practice has developed from the pre-risk communication stage wherein the public is largely ignored, to a stage where the public is treated as partners (Francisco and Tirol 2016). Effective risk communication is a professional discipline; its application requires knowledge, planning, preparation, skill, and practice. It is a two-way, interactive process that respects different values and treats the public as a full partner. As part of this process, non-experts acquire information about the risk in question and about the assessment and management of the risk. Experts and risk management authorities, in turn, acquire information about the interests and concerns of stakeholders (Covello et al. 2001). Engagement on scientific information such as environmental hazard can foster dialogue between risk bearers and risk managers as partners in the risk process, offering those most impacted the opportunity to voice their opinions and concerns. In applying an engagement lens, risk bearers can begin to see their agency in the risk management process, shifting the distribution of power (Palenchar et al. 2017). For Montemayor and Custodio (2014), public engagement entails understanding the phenomenon throughout the communication and information continuum, i.e., from the technical side, via media, and on the ground or the community.

The possible integration of the community's construction of disaster risk will bring about an enhanced risk communication framework. Given the varying perspectives and constructions in disaster literature, it is necessary to review and discuss the theoretical challenges that disasters bring in and emphasize the role of communication in mitigating disasters. For the science community to gain public trust and interest, which are key to reducing disaster risk, the public must be included in the discussions of scientific matters concerning them.

METHODOLOGY

The study explored the risk communication initiatives in the riverine community, descriptively. The researcher initially visited the research site at Barangay[1] Ilog, Infanta, Quezon, Philippines from August to September 2019 to observe the characteristics of the riverine community, including geographical location, physical attributes, livelihood, social organizations, etc. Analyzing secondary data from the official barangay or village database and records allowed profiling the riverine community. To elicit communication channels, strategies for disseminating disaster information, and socio-cultural construction of risk, face-to-face KII and FGDs generated primary data. Denzin and Lincoln (2005) maintain that unstructured interviews allow the researcher to understand the complexity of the situation without imposing any prior structure of the discussion and categorization. The researcher further reviewed secondary sources of data including official websites, public documents, and scholarly journal articles for data triangulation.

The FGDs were held among four social groups that included men, women, elderly, and youth from October to December 2019 (Table 2). These FGD participants reside in a riverine community in Brgy. Ilog. Their community is frequently struck by storm surges and typhoons. Another round of interviews with selected FGD participants and KI interviewees followed in January 2023 as follow-up and validation. Such discussion not only gave an opportunity to articulate internal thinking processes but also made it possible to clarify emergent themes and make new insights about the data. While several follow-up questions were asked to probe the research objectives, three questions in particular served as general guide questions:

1. *Kumusta po ang inyong buhay sa Brgy. Ilog?* (How is life in the riverine community?)
2. *Paano po ninyo nalalaman ang mga impormasyon tungkol sa bantang panganib?* (Where/how do you get information about disaster risk?)
3. *Paano ninyo ibinabahagi ang impormasyon tungkol sa bantang panganib?* (How do you communicate disaster risk?)

Table 2. Distribution of research participants in the focus group discussion

Code	Stakeholder Category	Number (n)
FGD 1	Men	5
FGD 2	Women	8
FGD 3	Elderly	5
FGD 4	Youth	6
FGD 5	Elderly[1]	7
FGD 6	Youth[1]	7
TOTAL		38

Note: [1]A second round of FGD was conducted.

Having four focus groups allowed collecting data from a variety of perspectives of the stakeholders in the riverine community. Each FGD had five to 10 participants. A second round of FGD with the youth and the elderly was further undertaken to augment the limited data gathered from the first round. Hence, the FGD participants totaled 38. Men and women participants belonged to the productive ages of 20–60 years old while the elderly groups were above the age of 60. Youth groups fell in the 8–19 years age range. It was necessary to include all age groups in the FGD to cover a holistic view of risk without age discrimination. The rationale for the FGD size was based on findings that "focus groups should include enough participants to yield diversity in the information provided, yet they should not include too many participants because large groups can create an environment where participants do not feel comfortable sharing their thoughts, opinions, beliefs, and experiences" (Onwuegbuzie et al. 2009). All the participants gave written consent and parental notification consent in the case of the youth. To observe research confidentiality and

1 The *barangay* (abbrev. brgy.) is the lowest official level of the decentralized local government system in the Philippines, which is comparable to a community in rural areas or a town district in urban areas. It has a formal leadership structure with an elected chairperson and councilors, as well as an administrative identity (Allen 2006).

anonymity, participants and cases were properly coded.

Transcriptions and code books were prepared from the recording of interviews. Primary data from FGDs and KIIs were subjected to thematic analysis geared toward: data familiarization, generation of initial codes, searching for themes across the data, reviewing themes, and writing a report (Braun and Clarke 2006). Meanwhile, secondary data underwent textual analysis. During the data analysis phase, the texts were examined for contradictions, similarities, and ambiguities emerging from the constructions of the participants. The literature was also constantly reviewed to make sense of the analysis.

RESULTS AND DISCUSSION

Characteristics of the Riverine Community

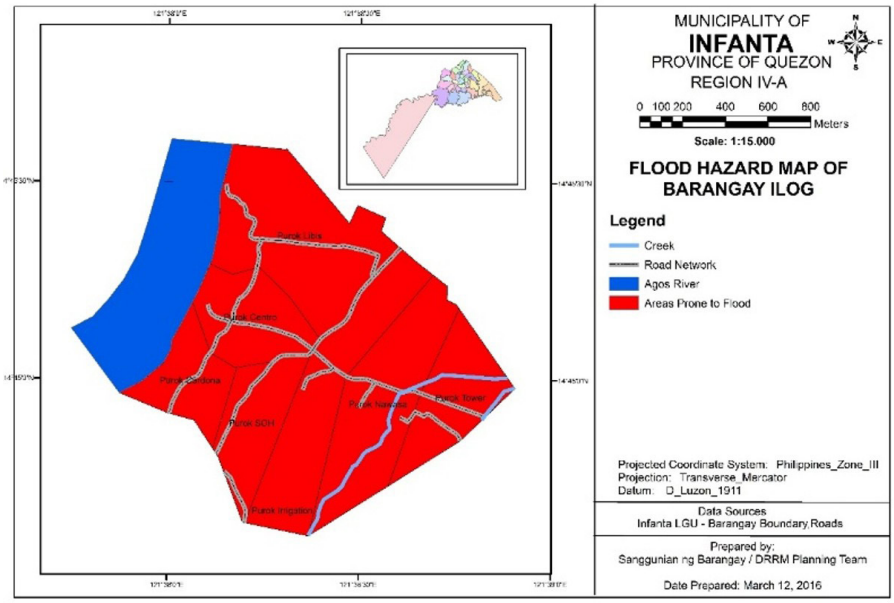
Location, land use, and susceptibility to hazards. Brgy. Ilog in Infanta, Quezon, Philippines was the research site. Brgy. Ilog, which literally means "a community by the river," or a riverine community, is located in the northwest region of the town about two kilometers from the town proper where the municipal hall is located. It has a total population of 2,715 or 569 households based on the 2017 census (BDRRM 2020). This community has a Type II climate based on Coronas' Climate Classification where there is no dry season but a very pronounced period of maximum rainfall from November to February. One may access the barangay through a concrete national road by tricycle or other light and heavy vehicles.

Brgy. Ilog is a lowland area with a homogeneous ecology covering a total land area of 160 ha. About 80 ha (49.9%) or half of the total area is used for agriculture, 50 ha (31.3%) for residences, 10 ha (6.3%) for livelihood, and the remaining 20 ha (12.6%) is idle. Situated along the banks of Agos River, Brgy. Ilog is considered moderately to highly prone to natural hazards. Because of its geophysical characteristics, Brgy. Ilog is identified by the municipal government as a hazard zone with high susceptibility to flooding (Figure 1); hence, at risk of natural disasters.

Physical characteristics vis-à-vis disaster management. Conceptualizing DRRM in the Philippines has taken great strides since the field has emerged. It has traditionally involved natural scientists and civil engineers and has concentrated on short-term single-stressor responses through structural measures, such as flood embankments, community shelters, and more resistant buildings. These were intended to control the natural processes in a way that would either modify the threat or provide physical protection regarding lives, property, and critical infrastructure (Thomalla et al. 2006). Continuous effort to improve the physical characteristics of the barangay is also evident. The local government initiated the river channeling and dike building project for the rehabilitation of the Agos River, including the area under the jurisdiction of Brgy. Ilog.

Livelihood. Natural resources are considered the richest and most important capital of the community. Because of the vast agricultural land and abundant water sources for free irrigation, most residents depend on farming as their livelihood. Generally, people who engaged in agriculture for livelihood own the land they till. Farm size ranges from a quarter to one hectare and the most reported farm area is half a hectare. The type of farmland terrain is lowland irrigated, and the soil is rich and loose. Because of flood risks, farmers refrain from planting rice to avoid the huge loss in their livelihood. During the monsoon season, most farmers postpone their agricultural work to avoid damage to their production and livelihood. Common crops include string beans, eggplant, and corn, which mostly rely on rain for irrigation. Besides planting high-value crops, some herbal medicines are also grown in the community. There are few livestock growers in the community, with some households owning farm animals like cattle and carabao.

Figure 1. Flood hazard map of Brgy. Ilog, Infanta, Quezon



Source: Municipal Government of Infanta, Quezon (2016)

Fishing is also a ready source of livelihood since the community is strategically located along the banks of Agos River. Unlike farming, fishing does not require inputs like seeds, pesticides, and fertilizers, which are a burden to most farmers. While residents of Brgy. Ilog mostly rely on agriculture and fisheries for their livelihood, a considerable number of residents engage in other industries. Non-farm jobs are limited to either service (e.g., carpenter, tricycle driver, laundry washer); trade (i.e., merchandiser); or salaried workers (policeman, public servant). People engaged in these small and scattered occupations appear to have limited job security, with levels of activity too low to provide financial stability.

Social organizations. Social organization is another important component of a community, referring to the network of relationships in a group and how they interconnect. This network of relationships helps members of a group stay connected to maintain a sense of community (Lee 2023). In the context of disaster risk management, social networks play an important role in supporting the rehabilitation and recovery of affected community members. Brgy. Ilog has several social organizations. The motivating reason to join an association could be the goods and other services that one can benefit from being a member. Members have access to loans needed for various purposes such as for livelihood, house expenditures, and other incidental expenses. A community-based organization like the Barangay Agriculture and Fisheries and Council (BAFC), for example, is a group of small-scale farmers who are privileged to receive subsidy allowances like free seedlings from the government to support their livelihood. The Center for Agriculture and Rural Development (CARD), on the other hand, is a credit-lending facility that mainly provides projects for social development. This local organization delivers microfinancing and insurance to members. The study observed that this lending system is the prime motivation why local people join these formal organizations, although meetings and gatherings also foster social relationships among members. However, women were more likely to join a group than men.

Accessibility and village facilities. A concrete road stretches across the community from the town proper where light and heavy vehicles can pass. With the geographic location of the barangay next to the municipal hall, residents have easy and improved access to public transportation. Most households own bicycles, a motorcycle, or a tricycle to get to town faster; but they can also reach the town proper by walking east for 15 minutes. Other facilities found in the village include a cellular network tower, a covered court or gymnasium that serves as a common venue for holding public meetings or gatherings in the community, three private schools, the barangay health center, and a two-storey multipurpose building. The covered court or gymnasium located in Purok Centro is accessible for the public to use as a recreational facility.

Communication Channels and Strategies for Disaster Risk

Knowledge evolves from the interaction between people and their surroundings. Hence, knowledge is not a firm fact but a social construct. Communication of scientific knowledge is a means to educate people to prevent disaster (Aragón-Durand 2009).

Utilizing thematic analysis from textual data of FGDs and KIIs, four modes emerged under the theme "disaster risk communication" (i.e., face-to-face communication, media, public awareness campaign, and rural risk communication) (Table 3).

Communication channels. Communication is the exchange of information between the sender and the receiver. Communication approaches that provide opportunities for interpersonal interaction are likely to yield desired behavioral change. Examples of interpersonal group communications include drama, song, storytelling, and debate, among others (Munodawafa 2008). The success of any communication experience relies on how the message was delivered. Thus, risk managers should consider the most appropriate communication channel for effective disaster risk communication.

Most development projects working on various agenda use communication approaches such as public awareness, capacity building, social marketing, and consultation with stakeholders, to name a few. The only difference is in the way they are delivered. Some organizations benefit from the convenience of web-based and mass media tools, while others keep the convention of print media (booklets, handouts, graphic sketches) and in-person interactions (interviews, folk plays, public presentations) to spread their messages across. Using these strategies, development actors not only multiply their efforts but also establish networks and build partnerships in implementing the project.

These are consistent with the findings in this study. In the research site, sources of disaster information or communication channels include face-to-face communication and various print and broadcast media. Regan (2007) as cited by Mycoo (2015) stressed that dialogue and interpersonal communication remain as the most effective strategy to elicit active engagement. Residents of Brgy. Ilog rely heavily on warning signals from their barangay officials, and the men in the community play a proactive role in information dissemination.

Table 3. Communication channels and strategies for disaster risk

Final Modes	Categories	Theme
Face-to-face communication	Communication channels	Disaster risk communication in the riverine community
Media (e.g., radio, television, information, education, and communication [IEC] materials, etc.)		
Public awareness campaigns (e.g., PSA, short messaging service [SMS], educational campaigns)	Communication strategies	
Rural risk communication strategies		

"Pag dito'y tag-ulan, 'yong mga lalaki, nado'n na sa Agos, nakatingin na sila. Ngayon, pag medyo malapit na, nakalembang na sila. Ibig sabihin, delikado na. Aalis na sila." (During the rainy season, men watch the Agos River and the water level. When the water rises, they send warning signals. That means it's getting serious and they start leaving.) (FGD 2/ woman 3)

"Nagtutulungan sila. Kinakatok bawat bahay, 'Hoy! Likas na! Likas na!' Tapos, meron silang bell*."* (They work together, knocking at every house, "Everyone! Let's leave! Move! Move!" Then, they ring a bell.) (FGD 3/elderly 1)

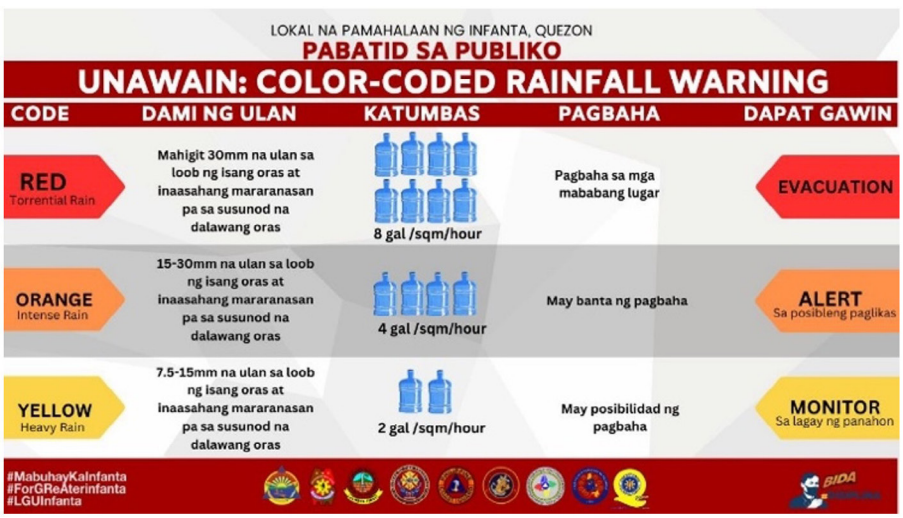
Meanwhile, the use of various media like television, radio, IEC materials, and social networks can be effective to disseminate information. The local government unit (LGU) of Infanta, Quezon and the Infanta, Quezon Emergency Response Team of the Municipal DRRM Office (MDRRMO) maintain active Facebook pages[2] that are widely subscribed to. The Infanta LGU uses these platforms to disseminate warning and alert signals (Figure 2) about environmental and health-related threats. A growing collection of media content also provides news and updates that are regularly posted on these pages.

TV and other video materials are among the most important sets of tools for communicating efficiently in a disaster risk situation. Media can provoke fear but can also raise awareness and preparedness. Television and other media are rapid and efficient communication tools in all stages of disasters (Cvetkovic, Öcal, and Ivanov 2019). The municipal government of Infanta has established the critical level indicator for weather-related events that are expressed through the following color codes:

- **Yellow** indicates heavy rain (7.5–15 mm rain/hour) and expected to continue in the next two hours. The possibility of flooding is likely, and it is advised to monitor the weather conditions.
- **Orange** indicates intense rain (15–30 mm rain/hour) and expected to continue in the next two hours. Flood risk is expected, and it is advised to stay alert for evacuation.
- **Red** indicates torrential rain (over 30 mm rain/hour) and expected to continue in the

2 https://www.facebook.com/mabuhaykainfanta
https://www.facebook.com/RescueInfantaQuezon

Figure 2. Sample IEC material on flood risk



Source: https://www.facebook.com/mabuhaykainfanta

next two hours. Communities with lower ground elevations have flooding. Immediate evacuation is advised.

Communication strategies. People need to consider every aspect of how they relay information. This is how communication strategies come into play. In the present study, public awareness campaigns included PSAs, SMS (i.e., text blasts), and educational campaigns. Putting up community kitchens and serving hot meals in various evacuation areas are some of the projects initiated by the local government that bring about greater participation in disaster response and reduced casualties.

"…'yong aming bahay ay s'yang noong dating tinitirahan ko'y…lahat kami'y magda-dry run hanggang sa kami'y nakahiga mag-asawa. Tatakbo palabas at may baha. May dala akong unan. (laughs) Noon ay napakadaming dumating na kung anu-anong ahensya na nag-aano sa amin dito pagdating sa baha." (...where I used to live, we would all conduct a flood drill. We would be lying on the ground, running outside for the practice drill. I carry a pillow with me. [laughs] Back then, a lot of agencies came to help us in the flood.) (KII 2)

As part of its rural communication efforts, it is also noteworthy that Brgy. Ilog took a bottom-up approach as a communication strategy during flood events. The information on the water level would come from the local people who would forward them to the barangay officials. Meanwhile, the officials would send this information to the municipal office for proper public advisory. The watchmen practiced local forecasting to advise the community when to evacuate their houses for safety. Based on their past flood experiences, the local people had become familiar with the behavior of Agos River. They developed forecasting techniques to predict its overflow. Another rural communication strategy that the local community has implemented is the use of floodlights in monitoring the river while lamp posts are rare on the streets of Brgy. Ilog. The floodlights warn the riverine community about a flood threat.

"Tantiyado na! Halimbawa, 'yong pampang na inyong dinaanan doon, pag medyo aawas na doon, 'yon! Magpapalikas na kami." (We can tell just by the looks of it. When the current is just over the riverbanks, that's it! We tell them to evacuate.) (FGD 1/man 1)

Disaster Risk Communication

Socio-cultural construction of risk. Disaster risk is deeply integrated with the cultural makeup of the society and dictates how social actors perceive threats, prioritize certain kinds of threat, and respond to crisis. In social constructivism, individuals seek an understanding of the world in which they live and work. They develop subjective meanings of their experiences—meanings directed toward certain objects or things. These meanings are varied and multiple, leading the researcher to look for the complexity of views rather than narrow the meanings into a few categories or ideas (Creswell 2013). Understanding the multiplicity of disaster risk construction among various social actors in the riverine community was best examined under the theory of social constructivism.

Coding and analyzing datasets from transcriptions of FGDs and KIIs resulted in 526 initial *in vivo* codes on the participants' socio-cultural constructions of disaster risk. Based on the recurring patterns, the most significant codes were reduced from 526 codes to three final themes, as follows: (1) riverine community as a "geographical other"; (2) riverine community as a permanent state of emergency; and (3) riverine community as disaster risk legitimacy. These findings on understanding the community's socio-cultural construction of disaster risk are foundational in crafting effective risk communication strategies.

In constructing the riverine community as a geographical other, spatial location or residential segregation played a key role in nurturing the

concept of "otherness". The participants perceived Brgy. Ilog as a fluvial, floodplain community displaying many of the characteristics of a geographical other. Embodying geographical otherness as a riverine community, the participants claimed to establish social cohesion. Their cultural identity tied to frugality, diligence, playfulness, and strong adaptive ability are their capital for disaster preparedness and response.

Interviews with the floodplain residents revealed that flood is the most challenging problem in their community alongside other important issues including hunger, poverty, and unemployment. Participants construed their community to be in a permanent state of emergency due to the overflow of the Agos River caused by heavy rainfall during typhoons or successive rains experienced most of the year. The overflow of the Agos River is one of the most triggering factors of floods. Because Brgy. Ilog is riverine, it shows three main intervening factors to flooding—geographical, hydrological (junction of Kanan and Kaliwa rivers), and meteorological—which cause significant damage to their lives and livelihood. The community's construction of disaster risk, which they constantly identified as riverine flooding, fits within their classification of a "natural" disaster, since they recognize that flooding is a natural process, and it has become part of their lives being a community situated next to a river.

However, the participants' conceptual framing on disaster runs counter to the theoretical claims of contemporary disaster management scholars who reject the "naturalness" of disasters. Many environmental agencies, disaster scholars, and environmental geographers affirm that disasters result from the combination of natural hazards and social and human vulnerability (Puttick, Bosher, and Chmutina 2018), and that framing disasters as "natural" denies the responsibility to minimize damage and destruction (UNDRR 2023).

Despite this, flood damage can be mitigated by preventive measures aimed at avoiding or alleviating the physical and socioeconomic impacts of flooding. To minimize disaster loss, the LGU developed and applied its own community-based disaster preparedness and management program composed of the following four-fold phases:

1. **Mitigation** includes activities to minimize risk such as structural measures for flood protection;
2. **Preparedness** involves DRRM plans;
3. **Response** covers a wide range of emergency and disaster response including relief and rescue operations; and
4. **Rehabilitation and recovery** includes recovery and reconstruction programs.

Acknowledging that disasters inherently threaten their community's built social structure and cohesion, the residents of Brgy. Ilog developed a disaster culture where threat is normalized. They acknowledge that riverine flooding is part of their lives as a riverine community.

Cultural framework for disaster risk communication. While this study supports the implications of socio-cultural components in disaster risk communication, it does not fully reject the utility of technical and scientific risk information. On the contrary, this research argues for a holistic view of risk, suggesting that improved communication on disaster risk knowledge and uncertainties should be founded on the values, identity, and behavior of local cultures. The involvement of the social sciences in DRRM can significantly improve communicating risk both to stakeholders and to wider communities (Donovan, Borie, and Blackburn 2019). This is so because the scientific community dominated by risk managers approaches risk differently from the local culture being exposed to the risk. This scientific divide has implications for risk communication. Local people's participation will substantially improve the information involved in disaster risk management and allow integrating local values to suggested preparedness and mitigation measures.

Overall, the study's findings suggest developing an integrated disaster risk communication framework toward effective, localized, and region-specific DRRM practice. In summary, these findings imply the following:

1. The riverine community of Brgy. Ilog and the municipal government of Infanta, Quezon are implementing a localized DRRM plan adopted from the national government but lacks a defined risk communication framework.
2. Natural resources and social organizations are the richest capital in the community, and create a sense of security among the local people despite repeated exposure to riverine flooding.
3. Communication channels and strategies for disaster risk in the riverine community are heavy on local participation and forecasting strategies.
4. The community's construction of risk is significantly informed by the memorability and imaginability of the community's past disaster experiences.

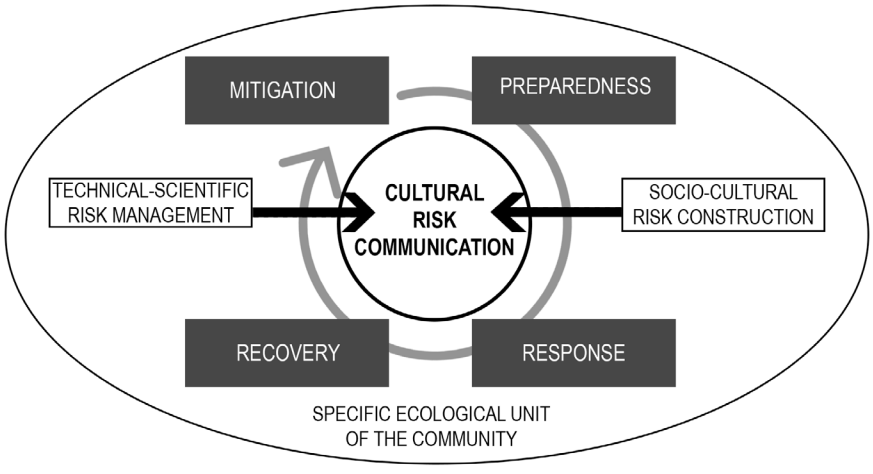
Figure 3 shows the proposed cultural risk communication framework, adopting the community-based disaster preparedness and management program of Infanta, Quezon, Philippines. It highlights the different stages of the process, with the integration of socio-cultural risk construction, and the deterministic and probabilistic risks, which are domains of scientific approach to crisis management.

Building on the existing DRRM model of Infanta, this study emphasizes the role of cultural risk communication in all its four phases—mitigation, preparedness, response, and recovery. Effective risk communication is a necessary component of all these stages and speaks across them. The communication strategies used in early warnings and preparedness are clearly central in the discussion of this paper.

Moreover, this study premises that disaster risk communication must be informed by a community's socio-cultural contexts with sensitivity to its homogenous ecological unit—whether an agricultural plain, estuarine, mountainous, urban, or riverine—in crafting disaster messages. Because different societies have different risk exposures, risk information should be based on the community's felt risk. Strong risk communication helps the public easily understand the nature and likelihood that hazards will occur.

Toward a localized and region-specific disaster risk communication framework, we advocate protecting the community's values,

Figure 3. Proposed cultural risk communication framework



identity, and assets that lie within the various stakeholders and key authorities in the community. Community participation must be promoted if risk communication is to become a successful DRR strategy. Results show that the disaster risk communication strategies of Brgy. Ilog follow a bottom-up approach, where community participation is vital to the success of an effective DRRM plan. This study thus offers a baseline framework for a disaster risk communication plan for riverine communities toward developing policies integrating socio-cultural factors in developing risk communication systems that are directly relevant for other communities.

CONCLUSION AND RECOMMENDATIONS

Existing literature point out the importance of social and cultural factors in setting risk agenda and in determining which risk narratives to emphasize or de-emphasize (Douglas and Wildavsky 1982; Blaikie et al. 1994). Social constructivism acknowledges that, in general, disaster risk is not generated by hazards that affect societies and communities alone. Rather, it is a product of social structures and dominant institutional practices. Disaster risk is not only primarily the outcome of geophysical processes but can be seen as created in social, economic, and political systems, including the product of failed development (Chipangura, Van Niekerk, and Van Der Waldt 2016). What societies choose to call risky is largely determined by social and cultural factors, not nature per se (Johnson and Covello 1987). Rather, it is socially constructed through political, social, and cultural framings. Disaster exposes the way in which people construct their vulnerability, including their denial of it (Hoffman and Oliver-Smith 2002). The physical, social, and ecological characteristics of a community should be considered in crafting disaster risk management efforts. Therefore, it is necessary to build risk communication programs around the community's socio-cultural construction and management of risk. Moreover, disaster risk communication should be more vernacular and more sensible in specific local contexts.

While existing literature asserts that disasters do not entirely arise from natural events, this study offers a novel perspective by examining how riverine communities construct disaster risk. Riverine communities are often overlooked in disaster studies, and these marginalized groups construct disaster risk as a "natural" phenomenon that they must adapt to. This study is also grounded on the social constructionist paradigm, which posits that meanings are produced and reproduced through social interaction, underscoring the key role of communication in the construction of reality and knowledge co-creation. Therefore, risk managers should encourage community participation through risk communication initiatives that reshape the public's construction of disaster from being framed as a "natural" event to one where the community feels empowered to take collective action in all stages of disaster management. Assuming that disasters are "natural" is oversimplistic and fails to capture the interplay of various factors on the impact of disasters on communities. This research offers practical insights and extends existing risk communication theory into how disaster management and risk communication practices can better account for these socio-cultural dynamics.

This paper attempts to propose a cultural perspective to disaster risk communication, challenging the contemporary frameworks on technocratic, universal risk communication. Understanding the interplay between the type of risk and the community's established worldview is vital for effective risk communication that leads to more adaptable and effective risk management efforts. This study does not reject, however, the need of a technical-scientific approach to risk management but suggests consideration for a socio-culturally sensitive and locally specific risk communication framework.

A cultural risk communication framework should consider the following key areas:

1. a communication model for DRRM that is sensitive to the type of ecological unit of the

community;
2. recognition of the role of local communities in enhancing risk communication strategies;
3. region-specific and community-based DRRM plan integrating local cultures; and
4. a holistic view of risk, combining scientific and cultural risk constructions.

Finally, risk communication can make disaster management more scalable by utilizing different communication channels and strategies that address the needs of the local, regional, national, and international levels. The potential for integrating the local community's characteristics in policy formulation for disaster risk communication should be informed by the community's existing communication sources and strategies as opposed to a universal and standardized risk communication planning.

ACKNOWLEDGMENT

The authors gratefully acknowledge the participation and cooperation of the local people of Brgy. Ilog, Infanta, Quezon, Philippines; the entire Sanguniang Barangay and the MDRRMO of Infanta, Quezon; key informant interviewees; and technical experts in the field. The main author is also indebted to the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) for funding this research.

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