

# SURVIVING WATER SCARCITY IN A SMALL ISLAND COMMUNITY

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The relative isolation of small islands has led to the development of unique ecologies and cultures. Their fragile environments, characterized by limited surface area and close proximity to seawater, have made water availability a major concern in most small island communities. Culture plays a significant role in the adaptive capacity of human populations on small islands to survive in such a vulnerable environment. This paper looks into how residents of Gilutungan Island in central Visayas in the Philippines have coped with water scarcity, specifically through water use and conservation strategies. These shall be linked to the broader socio-economic and political contexts. Qualitative research methodologies were utilized to get narratives of the residents' experiences of living on a small island. Findings point to water conservation strategies embedded in the culture of Gilutungan as water is highly valued on this small island due to its scarcity.

**Keywords:** *Water, small islands, ecological anthropology, water scarcity, Visayas*

## Introduction

***Water as an anthropological area of study.*** Water has been a theme of interest to anthropologists in recent years largely because of the growing need for this resource in many human populations (Orlove & Caton 2010). Water, from an anthropological perspective, beyond being a resource also has various social and cultural aspects. Water is rarely studied as an object in its own right but usually as a context, a framework, or a pretext (Wateau 2011). But Orlove and Catton (2010), following Mauss (1990), emphasize that water must be studied as a “total social fact”—as a phenomenon that cuts across different spheres of society —religious, political, moral, economic (cf Orlove

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& Catton 2010:402). Anthropological studies of water societies, whether in contexts of scarcity or abundance, should take into consideration such aspects as kinship, symbolism, territory, identity, and conflict, among others.

Water is a substance with specific properties that is understood and used in different ways in various social settings (Bachelard 1942; Hamlin 1990). Head (2012), in his study on cultures of urban water, points out that there is a great diversity in attitudes, behaviors, and practices both among individuals and between and among different groups of people. According to him, this diversity also possibly brings about different directions either toward or away from water conservation. Haddad (2005) points out that water supply and sanitation services affect people's lives, but these, at the same time, have an effect on the level, status, and development of water services. Schelwald-van and Reijerkerk (2009) likewise observe that in many traditional cultures, water is linked to a people's identity and has important social functions for specific groups. Indigenous peoples practice water resource management to maintain a balance between nature and human activity. Water plays a key role in most religious beliefs and rituals.

In the Philippines, water has traditionally been discussed from an environmental context and has been studied extensively by the natural sciences in terms of its physical, geographic, and ecological aspects. There have been a number of studies on water conducted by both government as well as non-government organizations in and outside the country (ASEAN 2005, EMB 2006, UN 2004, WB 2003, WHO 2006). A comprehensive study on the state of water resources in the Philippines by Greenpeace (2007) discusses the surface water and groundwater resources, the quality of water resources, the status of water use and supply, and the legal and policy framework relating to water quality control, use, and management. A paper by Dayrit (2001) of the National Water Resource Board (NWRB), which is the agency tasked to coordinate and integrate all activities in water resources development and management, discusses key elements in the formulation of a national water vision including demographic, economic, environmental, technological, institutional, as well as social aspects. It notes that lifestyles as well as cultural practices also affect the sustainability of water resources.

The current study uses the anthropological lens to look into the utilization, valuation, and conservation of water in an island-coastal setting in the central Visayas region of the Philippines. Specifically, it describes the socio-economic conditions in the given setting, water availability, water use and value, and conservation strategies practiced. This study focuses mainly on qualitative data highlighting perceptions and narratives of community residents on water use and conservation. Thus, findings cannot be

generalized to other communities with similar spatial and temporal contexts, as these may or may not be the same; each community is unique and has specific situations.

The study zeroes in on narratives of how local people utilize and conserve water given their environmental context, and thus focuses more on the subjective and cultural aspects rather than on the technical aspects of water use and conservation. Apart from contributing to the literature focusing on the relationship between water and culture and to the growing literature on the anthropology of water, findings may provide useful insights to government planners and policy-makers as well as to water service providers in improving programs and developing culturally appropriate awareness campaigns taking into consideration local users' perspectives.

The study was conducted in Barangay Gilutungan, an island-coastal community in the municipality of Cordova, Cebu. This site was specifically chosen to highlight how people cope with water needs in an environmental context where water is scarce. Island communities are abundant in the Visayas, but these are generally isolated by virtue of their geographic location. Access to the mainland requires going across bodies of water by boat. This makes it quite interesting to learn how island inhabitants adapt to such an environment given that water is important for human survival.

**Notes on methodology.** This study's research participants included water users in the community, as well as local government officials. Respondents were mostly fishers who primarily relied on fishing and other marine-related livelihoods. The participation of women in the study was also ensured through the conduct of separate in-depth interviews and focus group discussions (FGD). Key informants included elderly males and females, and local government unit (LGU) officials and community leaders. Two focus group discussions, participated in by between eight and 10 community residents in the productive ages (one FGD for males and one for females) who are native to the target site, were conducted to determine perceptions, values, and beliefs on water use and conservation. Another FGD for young people in these sites was also conducted.

This is a descriptive study primarily utilizing qualitative methodologies as well as secondary data analysis of archival documents. The purpose of using such methodologies is to gather in-depth information on people's awareness, perceptions, and practices from their own points of view. The researcher explained the objectives of the study to research participants and asked for their consent to participate in the study and have the interview or FGD recorded. Aside from audio recordings, the researcher kept and

maintained field notes containing field observations, as well as transcriptions of in-depth interviews and FGDs. The texts and narratives in the field notes are considered the raw qualitative data. These were analyzed using thematic analysis by means of coding the text based on identified themes from the research objectives. Important quotes were also noted in line with specific themes. Photo documentation of specific practices on water use and conservation in the target communities was likewise done. These provide a visual presentation of field observation data to substantiate the textual qualitative data.

This study is part of a larger research project on the cultural dimensions of water in various types of communities in Cebu conducted from November 2012 to October 2013. Fieldwork in Gilutungan was from January-June 2013.

### **The general context of water in the Philippines**

Despite concern for water conservation and management from various development organizations, data from various studies still point to problems as regards increasing water withdrawals and consumption in contrast to the availability of both ground and surface water resources, as well as decreasing water quality. Among Southeast Asian countries, the Philippines had the highest total withdrawals in 1990 and was projected to have the highest withdrawal as a percentage of annual water resources (Seckler et al. 1998) among Southeast Asian countries by the year 2000. Based on 2003 Philippine data (TWBG 2004), 63 percent of groundwater is consumed by the domestic sector and the remainder is shared by agriculture (17 percent), industry (13 percent), and other sectors (7 percent). About 86 percent of piped-water supply systems use groundwater as a source (TWBG 2003). Estimated water withdrawals as of 2003, based on water-right grantees registered with the National Water Resources Board (NWRB) is 77,456 million cubic meters (MCM) per year. About 60 percent of groundwater extraction is without permit, resulting in indiscriminate withdrawal. Over-abstraction from 6,441 registered wells has led to the lowering of aquifers, resulting in saline intrusion and ground subsidence in some areas (Greenpeace 2007).

NWRB has identified nine water-critical urbanized areas where water is consumed intensively. These include Metro Manila, Metro Cebu, Davao, Baguio City, Angeles City, Bacolod City, Iloilo City, Cagayan de Oro City, and Zamboanga City. Cases of water scarcity and shortages have been documented and reported in these places. It was reported that in 2007, water suppliers in the Visayas were faced with supply problems because of the drying up of water sources, one of the causes of which the agency has

attributed to climatic changes. According to Melchor Bibanco, president of the Visayas Association of Water Districts, most water districts experience supply problems, especially during the summer season, and these problems are getting worse every year (cited in Tupas 2007).

Experts project that by 2025, water availability deficits would take place in several river basins such as in Pampanga and Agno, in Pasig-Laguna, in Cagayan Valley, all other regions in Luzon, in Jalaur and Ilog Hilabangan, and in the island of Cebu in the Visayas (TWBG 2003). In Metro Cebu, problems related to water availability have been brought about by rapid population growth, declining water resources due to degradation of watersheds, water pollution, delay in developing new water sources, and an inefficient distribution system, among others. Metro Cebu is a fast-growing urbanized center considered second to Metro Manila characterized by rapid infrastructure development, industrial investments, trade and service establishments, as well as tourist facilities. With this growth, demand for water is expected to increase.

As an archipelagic nation, the Philippines has a number of small island communities, especially in the Visayas region. The United Nations, in a report, stated that the limited size of small island communities in terms of land area, economy, population, as well as their geographic remoteness, isolation, and narrow resource base makes small islands vulnerable to a number of external shocks (UN 2010). Rubis and Nakashima (2014) point out that the already limited freshwater supply of small islands is expected to be affected by climate change, specifically due to changing rainfall patterns and saltwater intrusion. Furthermore, climate change is also expected to affect marine resources which are largely the source of livelihood of small island communities. According to Rakels (2012), water supply in Cebu is considered critical due to the rapid industrialization and high growth in population of the area for the past two decades. Small island communities in Cebu's periphery all the more experience this water supply crisis as migration and tourism activities have increased in these small island ecosystems.

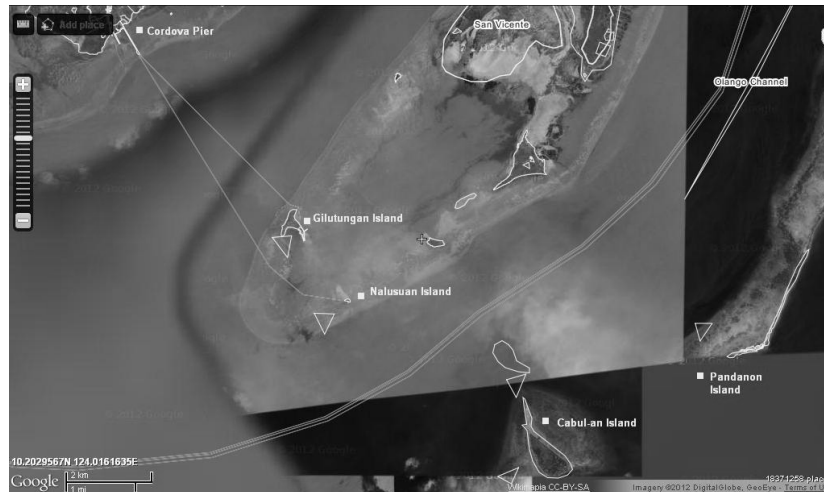
Gilutungan is one such island that both local and foreign tourists visit because of its marine sanctuary. An island-resort has been constructed on the island to cater to the needs of these tourists, including water. Water on the island for both tourists and local residents alike comes from the mainland, brought in by motorized boats.

The results of this study are divided into four parts: the socio-economic conditions of residents of the place, water availability in the research site,

local people's water use and valuation, and conservation strategies employed by the residents.

### Socio-economic conditions

Barangay Gilutungan in the municipality of Cordova, Cebu is a 12-hectare island located southeast of Mactan Island. Four sitios, namely Sampaguita, Gumamela, Calachuchi, and Waling-waling, comprise the area. It is located some six nautical miles from mainland Cordova, and it takes about 30 to 45 minutes to travel from the mainland to the island via a motorized pump boat (Figure 1).



**Figure 1.** Gilutungan Island in relation to mainland Cordova and neighboring islands. (Source: Google Maps)

Only about four motorized boats ply the route, on an irregular basis, for a ₱40 fare. However, during the months from July to October when there are strong southwesterly winds (locally termed *habagat*) resulting in the formation of large waves, it is difficult for motorized boats to traverse the sea between Gilutungan and mainland Cordova, increasing travel time to more than an hour. Fare rates also increase during this monsoon season. The island is characterized by a sandy, rocky substrate, composed of mostly sand along the beachfront, and rocks and limestone inland. Strong currents often occur close to the shores of the island.

The population of Gilutungan is constantly increasing based on census data. The total population was 440 in the 1970 census; 514 in 1980; 715 in 1990; 1,149 in 2000; and 1,442 in 2010. Barangay records in 2013 also showed an increase in population to 1,543. Population growth was highest from 1990 to 2000 with a rate of 60.70 percent for the ten-year period. The population density on the island is also steadily increasing over time.

**Table 1.** Population data, 1970-2013

<b>Year</b>	<b>Total Population</b>	<b>Inter-censal Population Growth rate</b>	<b>Population Density (persons per hectare)</b>
1970	440	---	36.67
1980	514	16.82	42.83
1990	715	39.11	59.58
2000	1,149	60.70	95.75
2010	1,442	25.50	120.17
2013	1,543	7.00	128.58

Sources: Flieger (1994), USC OPS (2004), 2010 Census of Population and Housing, 2013 Barangay Gilutungan records

A day care center as well as an elementary school on the island provide for the education needs of the population. For religious activities, there is a large chapel in one of the sitios, and other smaller chapels in the others. There is also a house of worship built by a Korean Presbyterian missionary in one of the sitios. Most residents rely on subsistence fishing as their livelihood. Based on data from the municipal government, 236 of 302 households in Gilutungan are engaged in fishing, representing 78 percent of the total number of households on the island. Common marine products gathered and sold by the fisherfolk on the island include *bakasi* (sea cucumber), different types of *saang* (mollusks), fish, and other marine animals (sea urchins, crabs, shrimps, etc.). Incomes are just enough for basic household consumption needs, according to local fisherfolk interviewed.

In the late 1990s to the early 2000s, *gusô* (seaweeds) farming was a lucrative alternative or complementary livelihood strategy introduced to local island residents by a Cebu-based seaweed processing company, a top

carageenan exporter. This has enabled seaweed growers on the island to earn additional income for education, health, and other household needs. Gilutungan's sandy, rocky substrate, and strong current make the place suitable for seaweed-growing (Barangay Captain Melchor Umpad, pers. comm., 4 May 2013). Based on municipal estimates as of 2009, about 200 families in Gilutungan were engaged in gusô farming. Approximately 24 hectares of Gilutungan's waters was used for growing seaweeds. At that time, income from gusô farming was estimated at ₱4,000 per household per month. However, according to barangay officials (pers. comm., 4 May 2013), the number of gusô growers has dwindled over the years largely due to losses as a result of typhoons and a lack of capital.

Gilutungan is also a popular diving site for local and foreign tourists frequenting the many beach resorts in Lapu-Lapu City on mainland Mactan, because of the Gilutungan Marine Sanctuary located on the west coast of the island, a 15-hectare marine protected area where coral reefs and marine life abound. Local residents, however, lamented that the resorts in Mactan and their tour operators and guides make big money from taking tourists to the Gilutungan Marine Sanctuary, but only a few Gilutungan residents have benefited from such tourism activities. The barangay captain said that the local government at both the barangay and municipal levels regularly earn revenues from the tourism activities on the island. There is also a tourist resort near the dive site. The barangay ensures the protection of the marine sanctuary by assigning fish wardens to watch over the area.

In sum, the socio-economic condition on Gilutungan is largely characterized by an increasing population relying on subsistence fishing supplemented with income from gusô farming. Even with the growing number of tourists visiting the marine sanctuary, only a handful of residents who sometimes serve as tourist guides to foreign and local tourists on the island have earned some income from this, since most of these tourists are brought there by tourist guides from resorts on mainland Mactan. Thus, income remains at subsistence level for most households. One of the daily needs to be met by households on the island is water for drinking, cooking, bathing, and other domestic uses.

### **Water availability**

A big problem faced by the residents on the island is water availability. In the 1950s, there was a groundwater source of fresh water on the island according to older members of the community. They said that there was a dug well providing for the water needs of the few residents on the island at that time. The well was located on a piece of land occupied by one



household, but it was open for all residents to use. The number of water users increased as population on the island grew over time due both to fertility and in-migration. According to one elderly respondent, the land-occupant where the water source was situated began to sell the water from the well for 25 centavos per bucket to the locals. After a period of time, residents noticed that the water was turning salty. As an elderly female informant narrated, "*Nikalit ra man tog kaparat ang tubig gikan sa atabay. Wa mi kabalo ngano.*" (The water from the dug well just suddenly became salty. We do not know why.) Folklore has it that the "owners" of the water (meaning, the supernatural spirits) got angry that the water was commercialized, and thus the water from the well became saline and was considered no longer fit for drinking. According to one informant, "*Ingon akong apohan nasuko kuno ang mga tag-iya sa tubig nganong gipabayran na ang tubig nga libre man nang gihatag aron magamit sa tanan. Mao nga niparat to.*" (My grandmother told me that the owners of the water got mad that the water was sold, when it was given by them for free for all to use. That is why it became saline.) Scientists might argue that the reason for the salination of the water source is due to over-extraction. But local folklore seems to prevail in terms of explaining such phenomenon on the island. The land occupant also renovated their house using concrete materials, then fenced off the area and closed the well. From then on, there was no longer any source of fresh water on the island. Although there are five other dug wells on the island, water from these wells is salty and is only used for flushing the toilet and cleaning, not for drinking or cooking. These wells also dry up during low tide.

Since the well was closed, rain became the only source of fresh water on the island. Old folks recalled the time when all they could use for drinking and for domestic activities was rainwater. Rain was such an important water resource that each household installed big water jars (locally called *martabana*) or tanks for collecting rainwater (Figure 2). However, rain was naturally abundant only during the rainy season. As residents narrated, "*Kulangon gani among mga martabana ug baril kung kusog ang ulan, magawas awas na, usik sad baya.*" (Our large jars and water containers overflow if there are heavy rains; it's such a waste.) A regular-sized *martabana* can collect more than 100 gallons of rainwater, while a regular-sized drum or barrel can collect about 50 gallons. Other houses with no gutters on their roofs are not able to efficiently collect rainwater; thus, they have to buy from their neighbors. Rainwater is sold at ₱5 per five-gallon container. But most residents also buy fresh water from water distributors for drinking purposes aside from the rainwater bought from neighbors during the rainy season.

According to old folks, the new generation no longer drinks rainwater as they did in the past.



**Figure 2.** *Martabana* water jars for collecting rainwater. (Photo by the author).

During the dry season from March to May, residents have to buy fresh water from water distributors who go to mainland Cordova to fetch water either from private deep wells or faucets installed by the Metro Cebu Water District (MCWD), the main provider and distributor of water in Metro Cebu. These water distributors made arrangements with some Cordova residents near the Bantayan wharf so that they could fetch water from their wells or faucets for a fee. In 2006, because of the water problem on the island, a non-government organization based in Cebu City provided assistance in the establishment of the Gilutungan Water Distributor Management Cooperative on the island. They applied for water connection at the MCWD and installed a water tank at the Bantayan wharf in Cordova where boats from Gilutungan usually dock (Figure 3). Selling of water was managed by the cooperative. This made fetching water on the mainland easier because of the location of the source. However, in 2014, water connection was cut due to bills unpaid by the cooperative. Gilutungan residents reverted to their old practice of fetching water from Cordova residents.



**Figure 3.** A water tank in Cordova. (Photo by the author.)

When this study was done, the cooperative's water project was still in operation. They sold water for ₱2 per five-gallon container. The cooperative members took turns overseeing the fetching of water at their tank and they were given a commission of 50 centavos per container. Thus, the cooperative earned ₱1.50 for every five-gallon container of water bought from them. At that time, six enterprising Gilutungan residents who owned larger motorized boats ventured into selling water bought from the mainland to those who did not own motorized boats, or who did not have enough capital to buy the fuel needed just to fetch fresh water from the mainland. Their boats could accommodate an average of 200 five-gallon water containers (Figure 4). They stored the water in five-gallon containers and brought these to the island for selling. They sold water in Gilutungan at ₱15 per container including delivery to the homes of the buyers. If the buyer himself fetched the water from where the motorized boat is docked, then he only paid ₱10 per container instead of ₱15 since there was no delivery cost. Thus, fresh water was more expensive compared with rainwater. During the dry season when there was no rainwater harvested on the island, residents had to procure more water from distributors since there was no other source.

According to one water distributor, they had to mark up the price of water per container since they also accrued a lot of expenses in fetching the water from the mainland. Expenses included gasoline, daily wages of the

boatman and assistant, as well as labor cost for hauling, amounting to a total of ₱1,600 on the average. In fact, there were other water distributors who had ceased operations due to losses and lack of capital. As one of them said, “*Di sad lalim magnegosyo of tubig sa isla uy kay daghan kaayug gastuhanan, gamay ra kaayu ang ginansya, hagu pa.*” (It’s not easy to do business distributing water on the island because there a lot of expenses; you only get a small profit and it’s very tedious.) For one round-trip, about four to six liters of gasoline was consumed, amounting to ₱200 to ₱300. Wages for the boatman and his assistant amounted to about ₱500 per day. The labor cost for hauling was about ₱400 per day. This left about ₱400 as profit for the water distributor in a day. Maintenance costs for spare parts and other needs of the motorized boat would be taken from the total net proceeds per month.

During *habagat* months, the locals seldom go to mainland Cordova as waves are too big and may affect the running condition of the motorized boats. Thus, water supply on the island is also affected. Local distributors have also recently begun selling mineral water or purified water at ₱50 to ₱60 per five-gallon container, or twice their price on the mainland. Some residents sometimes bring a water container with them if they have to go to mainland Cordova for other purposes. In this manner, they are able to save on water cost from time to time.



**Figure 4.** A motorized boat that ferries gallons of water to the island. (Photo by the author)

### Water usage and value

Primary uses of water for every household include drinking, cooking, and doing laundry. Fresh water is preferred by households for these purposes. In the past, island folks made do with rain water for such uses. A number of elderly residents say they still drink rain water. As some informants shared, “*Mas lami ang ulan kay tam-is tam-is.*” (Rain is more delicious because it tastes a bit sweet.) They just put a small amount of chlorine in the container to “purify” the water and then they can already drink it. However, with the availability of fresh water from mainland Cordova from water distributors, a number of residents have shifted from rainwater to tap water, and lately to purified water/mineral water. These types of water being used by island residents also vary in terms of value or cost. While rainwater can be bought locally at ₱5 per container, freshwater brought in from Cordova costs ₱10 per container, and purified water is priced at ₱50 to ₱60.

Based on interviews and FGDs, an average household with five members utilizes more or less three five-gallon containers a day for drinking, cooking, doing laundry and other domestic uses. If we were to compute the water cost per household given an average daily consumption of three containers at ₱15 per five-gallon container (including hauling cost), then total monthly cost would be ₱1,350 for 450 gallons (or 1.7 cubic meters) of water. This is rather high as compared with the water district’s minimum charge of around ₱500 for the first 10 cubic meters (or roughly 2,642 gallons) consumption. If we exclude hauling cost, each household still spends ₱30 per day or ₱900 per month for fresh water alone. This is already a conservative estimate, considering the conservation strategies that Gilutungan households usually employ to minimize the expenses for water. According to them, “*Mahal man kaayu ang tubig diri sa amoa, mao nga daginoton namo ang paggamit.*” (Water is very expensive here in our place, that is why we really conserve it.) If a household has more members, then water cost also increases. There are also occasions, such as fiestas, when households consume more water than they regularly do.

Considering the income levels of most fisherfolk on the island, it can be said that water cost takes more or less 25 percent of the monthly income of those engaged in gusô farming. But for households with no income source other than subsistence fishing, the amount set aside for water expenses could well be more than 50 percent of their income. Those engaged in the water distribution business tend to consume more water than their neighbors since they have greater access to less expensive water on the mainland. There are only six water distributors on the island and all of them occupy positions in

the barangay local government unit. Barangay officials also occupied the highest positions in the cooperative then. According to an informant, “*Ang mga namaligya og tubig ang kasagarang mudaug sa eleksyon kay musaad man sila nga butangan na og sistima sa tubig dinhi sa isla, apan hangtod karon saad ra man gihapon. Sila ra ang nidatu.*” (Those who sell water are also the ones who usually win during elections because of their promises to set up a water system on the island, but until now these have remained promises. They are the only ones who got richer).

Based on the monthly bills from MCWD, the cooperative managing the water project, water consumption of the island reaches an average total of 5,000 cubic meters (or 1,320,860 gallons) per month and increases during the dry season to around 6,000 cubic meters (or 1,585,032 gallons). Given these figures, it can be computed that the cooperative makes an average of ₱396,258 a month. Monthly water bills of the cooperative’s water distribution enterprise only amount to more or less ₱15,000 on the average. This means that the water cooperative’s business endeavor was very profitable. The scope of this study, however, did not include the details of the cooperative’s financial management of its water project, which is no longer operational as of this writing.

### **Conservation strategies**

Given the problems on availability and high cost of water, people on the island of Gilutungan are very conscious of conserving water. Because of the unavailability of fresh water, major infrastructures on the island, namely the school, chapels, the barangay hall, and the health center, have incorporated rainwater collection tanks in their buildings. Houses with galvanized iron roofing have also installed *martabana*, barrels or tanks right below the gutter and down spouts of their roofs. Even a congressman funded a rainwater collection tank project placed beside the barangay hall. There were problems, however, in the construction of these rainwater tanks; water drained out due to some leaks in the tanks.

Water conservation practices are very common due to the scarcity of water on the island as well as the high cost of water brought in from the mainland. Most households calculate and estimate their water utilization in advance in order to maximize the use of water for different purposes. Based on the interviews, residents shared that usually one container would be used for bathing by one person, but during the dry season, they either minimize water use to a few *cabo* (the Cebuano term for the Tagalog *tabo*, dipper), or minimize the number of times they bathe in a week. Bathing in the sea is likewise resorted to after which they utilize only a small amount of water for

soaping, shampooing, and rinsing. Some residents say that sometimes they just make do with washing their face with one cayo of water. Cooking is also done fewer times in a day to conserve on water for washing and cooking rice. To save on daily water costs, they utilize other sources of water, including seawater and rainwater for most of the household uses. Priority is given for drinking and cooking purposes. For bathing, seawater would do for most young people with a small amount of fresh water for rinsing.

From FGD responses, the following strategies have been utilized by island-residents: using collected rainwater for bathing or washing plates and utensils, bathing directly in the rain during the rainy season, not taking a bath everyday especially during the dry season, washing fish and other marine products with sea water before cooking, bathing in the sea before applying soap on the body, and rinsing with around two dippers of fresh water. As jokingly shared by FGD participants, "*Bisag usa o 100uh aka-kabo ang ikaligo, payts na.*" (Even if we use only one or two dippers of freshwater, that's good enough for us.) Thus, freshwater bought from water merchants is primarily used for drinking, cooking, and washing clothes. As one informant said, "*Siguradohon ang inom ug lung-ag; ang laba di lang kada-adlaw. Lisod man ilaba ang ulan kay dangog man, kas.*" (We prioritize drinking and cooking; we do not wash clothes every day. It is difficult to use rainwater for washing clothes because it cannot rinse the soap well. It would be such a waste of water.)

Other strategies were shared by residents during the FGD and in-depth interviews. These strategies largely depended upon each household or individual. Generally, however, residents on the island are conscious about conserving water through minimizing water utilization and reusing and recycling water.

### **Water: perceptions and practices**

While people in the coastal island community of Gilutungan have learned to adapt to their physical environment, especially in terms of water availability, their social and economic activities have likewise affected the availability of such a resource. Increasing population is one of the most pressing factors affecting water supply especially on small islands as evidenced by demographic data as well as from accounts of local residents. High fertility as well as in-migration have contributed to the increase in population. The impact of a growing population on water availability is seen in the salt water intrusion in the old water source of Gilutungan due to over-extraction.

Aside from this, water use is largely determined by the type of activities in which people in the community engage. The scarcity or absence of water sources triggers water conservation practices just like in the case of Gilutungan. Island inhabitants have created various ways to maximize water use given the limited supply, such as through “budgeting” water for specific uses and harvesting of rainwater. The designing of the *martabana* placed outside their houses to collect rainwater is one concrete illustration of the people’s creativity in adapting to environmental conditions. Seawater is likewise considered an alternative for use in domestic as well as livelihood activities by island residents. This illustrates the flexibility of people in adapting to their given environment, considering that most of them have lived on this island all their lives and have survived until now.

However, not all people in a given area have similar ways of perceiving, using, and conserving water, as there are also differences among them based on gender, age, and class. The study notes from the FGDs conducted that the younger generation of residents on the island is less concerned about conserving water compared to those in the older generation. Furthermore, FGD participants perceived women to consume more water than men since they are the ones usually directly involved in domestic activities which utilize more water, such as cleaning, washing, cooking, and the like. Variations in use and conservation are also based on economic status, since those who can afford to buy water tend to consume more and are less concerned with conservation, as compared to the resource-poor households.

The variations in water sources, water use, and water conservation in the community illustrate that environmental and social contexts are important determinants on the use, valuation, and conservation of water. It is apparent that in an island-coastal community like Gilutungan where water is scarce, people tend to conserve and regulate water use, or apply a number of conservation efforts. Individual differences, however, in water use and conservation exist due to varied experiences given age, gender, and economic status differences.

Over time, water supply and quality have also changed, bringing about changes in cultural perceptions and practices as regards water use and conservation. From their previous practice of drinking rainwater, present generations in Gilutungan now prefer to drink tap water which is imported from Cordova in five-gallon containers. An observable trend nowadays is the increasing use of commercial bottled mineral water for drinking because of the strong perception by island residents that water quality of local sources is low compared with bottled water which is generally perceived as cleaner because of the more advanced water purification technology utilized.



Innovations in distributing this kind of water to the public have brought this practice even to lower income classes in island-communities. From such trends and situations, water has become more commodified, further limiting access especially for resource-poor households in relatively isolated environments such as small islands. Comprehensive programs to address this growing concern on water availability should be conceptualized and implemented by government agencies tasked to do this.

### **Conclusion**

This study points out that water availability and access are major concerns especially in relatively isolated environments. These concerns need to be addressed in archipelagic countries like the Philippines. It also points out the tendency of residents to conserve when and where water is scarce and expensive. Instilling in communities a consciousness to conserve water, nevertheless, needs to take varied forms based on their respective contexts. There need to be a variety and a diversity of strategies that are attuned to the situation and are acceptable to the local people. Furthermore, this study likewise points out that human activities, the growing population, livelihood activities, as well as water use and conservation practices, have a large impact on the physical environment, which, in turn, affects local residents. It thus becomes a never-ending process of human adaptation to changes in the environment which people themselves have caused.

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