

UC Irvine

World Cultures eJournal

Title

Fishermen's Concepts of Environmental and Climate Change in Batangas, Philippines

Permalink

<https://escholarship.org/uc/item/56m9h8dt>

Journal

World Cultures eJournal, 22(2)

Author

Wiegele, Katharine L

Publication Date

2017

Copyright Information

Copyright 2017 by the author(s). All rights reserved unless otherwise indicated. Contact the author(s) for any necessary permissions. Learn more at <https://escholarship.org/terms>

Peer reviewed

Fishermen's Concepts of Environmental and Climate Change in Batangas, Philippines

Katharine L. Wiegele, PhD, Northern Illinois University

Introduction

This work is based on six weeks of field research at two separate field sites in Batangas, Philippines from March to April, 2014. The primary goal was to discover the cultural model(s) of nature held by full-time and subsistence fishermen in this very important marine ecological zone, the Verde Island Passage. Questions driving the research included (a) how do fishermen understand human relationships to various elements in the natural environment including weather, climate, fish, animals, and the supernatural, (b) how and why are the climate and natural environment changing (if they are changing) and (c) how and why is food production (fishing) changing.

Two fishing communities, one in Bauan and one in Lobo, Batangas, were chosen for their variation in terms of the influence of non-governmental and governmental conservation education efforts, the presence of tourism and marine protected areas, methods of fishing subsistence used, their proximity to industry, and the relative health of the land and marine habitat. I looked for differences in perceptions of climate and environmental change and local knowledge about nature and climate in general and as it relates to food production. I conducted 18 semi-structured interviews and 36 free-listing tasks.¹ Local environmental conditions and climate and weather patterns, changes in these conditions and patterns, and the possible causes of these changes were discussed by informants in the interviews. These topics are analyzed in this article using gist statements and metaphor analysis to identify features of a cultural model of nature present in the two communities of fishers.² Research methods also involved participant-observation, fishing expeditions, and nature-walks with informant narration.

The Field Sites

Both communities are located along the Verde Island Passage, a part of the Philippines known as one of the most important marine ecological zones in the world. The entire Philippines is part of the Coral Triangle,

...a marine area located in the western Pacific Ocean. It includes the waters of Indonesia, Malaysia, the Philippines, Papua New Guinea, Timor Leste and Solomon Islands. Named for its staggering number of corals (nearly 600 different species of reef-building corals alone), the region nurtures six of the world's seven marine turtle species and more than 2000 species of reef fish. The Coral Triangle also supports large populations of commercially important tuna, fueling a multi-billion dollar global tuna industry. Over 120 million people live in the Coral Triangle and rely on its coral reefs for food, income and protection from storms.³

The Philippines is widely recognized as a global priority for marine conservation. There are more marine animals in a meter of ocean water in the Philippines than anywhere else in the Coral Triangle. The Verde Island Passage, the location of the two field sites, is located between southern Luzon and Mindoro islands. It has the greatest variety of shore-fish species in the Coral Triangle, indicating that a vast

wealth of other species resides there as well. For that reason has been dubbed “the center of the center of marine biodiversity” in the global context.⁴

Bauan, Batangas, the first field site, is a community of 81,000 (2010) located on the shore of Batangas Bay around 10 kilometers from Batangas Port. I first conducted research at this site in 1991. It is the most industrialized municipality in Batangas Province. The priority of the municipality appears to be industrializing and capitalizing on its strategic location with regards to Batangas Port, the second largest port in the country. However, the municipality is home to a number of Marine Protected Areas which are used by local beach and dive resorts for tourist snorkeling and scuba diving. The bay is a heavily-trafficked shipping route and numerous industries and communities line the coast. Much of the habitat has been heavily compromised.

The municipality has an old, well-established tradition of small-scale commercial fishing, and the field site is located in a shoreline area of San Andres, a municipality known for its high concentration of small-scale baby purse seiners with gill nets (*pukotan*). In addition, various other types of subsistence and smaller-scale fishing methods are employed with a variety of smaller vessels.

My interviews focused on captains, crew members, and vendors associated with the large fleet small-scale baby purse seiners. Changes in seasonal weather patterns including the increasing unpredictability of weather and storms effects them greatly. The boats, nets, and other equipment require a substantial capital investment to maintain them, due to the large size of the vessels and nets. A crew of around 15 men must be maintained as well as smaller vessels that assist in fish capture. Costs to launch the boat, to beach it, or to engage in fishing expeditions are high, as are municipal permits and registration of fishing vessels. The vessels must be beached during stormy weather and re-launched later, a labor-intensive and costly proposition. Uncertainty caused by changing climate and weather patterns or decline in fish populations can spell permanent economic collapse for a boat owner and their crew members. Smaller-scale fishers (for example those involving smaller boats and crews of 1-5 men) have more flexibility in terms of altering their fishing patterns in response to unusual and unexpected weather variation; they also have lower economic stakes with lower capital investment.

Although *pukot* fishers have always dealt with a degree of unpredictability, their traditional coping strategies⁵ appear to be losing effectiveness given the increase in weather-related uncertainty and unpredictability changes in fish availability.

Lobo, Batangas, my second field site, is a municipality of 37,000 (2010) approximately 60 km east of Bauan. In contrast with Bauan, it consists of a relatively pristine marine and shoreline environment. There are no large industries in the area, and its location outside Batangas Bay means it is relatively unaffected by major shipping traffic. The municipality has a progressive agro-tourism vision of growth that emphasizes ecological balance, sustainable growth (social, cultural, and economic), and food. There are many beach and dive resorts. In 2005, the Lobo municipal government declared one area of its shoreline a fish sanctuary and now the entire three kilometers of shoreline and 300 meters (980 feet) fronting the shore has been declared a protected area. Fishermen in the field site area do primarily part-

time subsistence fishing (they also farm). They use a variety of fishing techniques but none as large as the *pukot* fishing found in Bauan. Artificial reefs have been installed in some areas, and exposure to governmental and non-governmental conservation training among locals is more common in Lobo compared to Bauan.

General Normative Understandings of Seasons and Moon Phases

Seasons: In both communities, informants described two seasons (sometimes three), distinguished and named by either temperature, rainfall, wind/sea current strength, or wind direction.

hot and cold seasons	<i>temperature</i>
hot [or dry] and rainy seasons	<i>rainfall</i>
strong [or difficult] and calm seasons	<i>wind strength/sea current strength</i>
habagan and amihan seasons (may include salatan)	<i>wind direction</i>

The full-time fishermen in Bauan often characterize the seasons according to wind direction and wind strength/sea current strength, while the part-time fishermen in these field sites who also farm tend to use temperature and rainfall to distinguish seasons, as do full-time farmers. Many changes in annual seasonal patterns were noted by fishermen and other locals (see below). Key word analysis of the interviews supports the saliency of wind direction and strength (and hence the importance of typhoons and their timing) for the small-scale, full-time commercial fishermen in Bauan, and the additional saliency of heat and rainfall for the more casual fishermen in Lobo whose subsistence depends both on farming and fishing (see Note 2).

The Moon and Fish Behavior: In both communities, fishermen used the phases of the moon to time fishing trips. In addition and perhaps tangentially, some farmers noted a positive connection between rice seedling growth and a waxing moon phase, while crabs and sometimes fish were noted to grow more during a waxing moon. However, in Bauan especially, many fishers observed that the traditional system of using the moon to time fixing expeditions is now “broken.” In other words, timing fishing with phases of the moon is no longer an effective technique for increasing fish capture. This was attributed either to the general lack of fish due to pollution in the bay, changes in weather patterns, or unknown/unknowable reasons.

Changes in the Environment, Climate, and Weather Patterns

Locals in both communities noted many changes in the natural environment and the weather (often climate and weather were used interchangeably). Many of these changes had a direct impact on their livelihood as fishers and cultivators. The changes are noted here using wording close to what the informants used.

BAUAN

The beach is smaller by 50 meters (thus the houses are closer to the sea).

The seasons are more unpredictable (typhoons during dry season, delay of seasons).

The weather changes more abruptly (from hot to cold, rain to shine).

The weather is “stronger” (extreme heat, extreme rain, stronger storms).

*More rain comes with storms, there is more flooding.
We are more "exposed."*

The mountains are deforested.

The houses are closer to sea (due to sea level rise).

There are no corals or plants in the bay.

There are fewer fish per catch and throughout year.

The bay water is warmer.

The behavior and presence of fish in Batangas Bay is unusually unpredictable with regard to

Seasonal presence of species

Seasonal quantity

Presence during phases of moon

Length of time specific species stay in the bay

Quantity of fish available for capture annually

Annual variety of species typically caught (number down from 10 to 2-3)

Changes in seasonal weather patterns, especially the onset of rainy season, were so pronounced that a shift in the school year calendar was being contemplated by officials at the time of the fieldwork. In addition, there had been several years recently in which *pukot* fishermen caught no fish for the entire year.

LOBO

The storms come out of season (typhoons come during dry season).

The cold season extends longer.

The hot season extends longer.

The environment has become "stronger."

The heat and cold are more extreme.

There are more abrupt changes in temperature.

The thunder and lightening are more frightening now.

The weather is hotter, dryer, more windy.

There is more flooding, erosion.

A few informants in Lobo reported no changes in the weather, environment, or climate. A few reported that their environment was being gradually restored because municipal laws regarding the use of land and marine resources were being enforced.

Causes of Changes in Climate, Environment, and Weather

Among informants' explanations of the changes in climate, the environment, and weather patterns they had observed, the following causal themes emerged, suggesting some patterns in the relationships between humans, the natural physical environment, and weather.

Climate and weather are beyond human agency in general: The tendency to view climate and weather as beyond human agency in general was noted in both field sites. The following are examples of gist statements to this effect.

There is nothing humans can do [regarding changes in weather patterns].

Humans cannot know why the climate changes, we can only observe the changes.

The climate effects us, we do not effect the climate.

The climate changes and we have to adjust.

We can adjust, but there will come a time when we can no longer adjust.

Some of these statements might reflect the concept of balance and equilibrium as a fundamental element of life that has been described by Jocano (2001) in his broad and long-term comparative studies of Philippine culture and worldview.⁶ This traditional conception, while not explicitly articulated in my field sites, may point to an unconsciously held aspect of the cultural model of nature there, and deserves further investigation. In this model, as Jocano explains, life processes involve a balance of positive and negative forces such as hot/cold, growth/decay, male/female, etc. This balancing process inherently involves temporary imbalance that brings about growth (similar to a metabolic process) necessary to keep things developing. Humans must remain neutral in this process. The role of humans is one of adjustment or adaptation in order to maintain balance. Adjustment is part of the dynamic of human-nature relations. Adjustment may involve change in values, attitudes, and relations. However it is possible to have unfavorable disequilibrium that can bring disaster or destruction so great that it cannot be repaired.

The general tendency to view climate and weather as beyond human control may stem from this underlying model of human-nature relations. In the statements above, humans adjust to climate (and weather) changes but do not change the climate. There is also a recognition here and in other statements (see below) that weather and climate changes may eventually reach a tipping point at which they are broken beyond repair and/or humans can no longer adjust.

Human activities in this area destroy the bay habitat: While informants generally do not conceive of weather and climate as within human agency, many reported that people create pollution that destroys the natural environment, specifically the nearby, immediate environment and the people who live in or exploit this environment. This activity was often linked to the health of the Batangas Bay habitat. A few also connected pollution to increased heat and lower fish stock in the bay. Many attributed the rise in sea level to activities of industries in Batangas Bay. None spoke of human activities generally or on a global scale as causing environmental destruction (although three people blamed Filipino national character). The following gist statements illustrate this point.

Industries here dumped soil in the bay causing the water level here to rise. (Bauan)

Corporations, ships, refineries pollute Batangas Bay. (Bauan)

My neighbors dump garbage in the bay. (Bauan)

Bay pollution makes the water hotter. (Bauan)

Developments here leave no space for mangroves. (Bauan)

Illegal fishing methods scare the fish away. (Bauan)

Factories destroy corals. (Bauan)

The destruction of the environment causes too much heat. (Bauan)

The weather is hotter because there's too much development now. (Bauan)

Fish cannot reproduce when the weather is too hot. (Bauan)

Fish die/go away when it is too hot. (Bauan)

Deforestation causes flooding. (Lobo)

Filipinos are "hard-headed" by nature; they will never stop. Some people are just greedy. Others are only supporting their families. (Lobo)

You can't blame people, corporations, or the government: Although industry and development in the immediate vicinity caused habitat destruction, health problems (air pollution), and a decline in the fishing industry in Batangas Bay, many of the Bauan fishermen there stated that these activities were inevitable and unavoidable due to the inherent roles and responsibilities of family members, industry, and government, as these gist statements illustrate.

*Corporations ruined the bay but we rely on them for jobs to support our families.
Working for the companies cannot be avoided.
The government sells the land to corporations but the government must develop the country.
People use illegal fishing methods but they are also trying to support their families.*

Explanations referencing God: Though not a dominant theme, some informants offered Christian-based understandings of weather and climate change. These explanations combined aspects of other explanations mentioned here, including human culpability (and agency by implication), lack of human agency, the weather/climate as human metaphor (see below), the weather/climate as a cycle metaphor (see below), and the unknowability of weather/climate. The following gist statements and direct quotes place God in a variety of relationships to humans and the climate.

*Maybe the weather changes because God is punishing the people. God is mad at the people because they are getting wiser than God, they are bad, crazy.
People lack faith, prayer, going to church.
"Only God can know why the weather reverses."
"The environment is having a tantrum. Even God is having a tantrum."
"Personally I don't know why the weather changes because neither we nor God make the weather, but the natural environment does it."
"They said that the weather (climate) from before will soon return. The past will return according to the Bible."*

Metaphors Used to Explain Climate and Weather Pattern Change

In both communities, two metaphors were used to understand and talk about climate and weather changes: (1) the climate/weather as human and (2) climate/weather change as a cycle.

Personification of Weather/Climate (Weather/Climate as Human Metaphor):

In this metaphor, the weather has moods, reactions, idiosyncrasies, and a life cycle similar to those of humans. The most widespread application of this metaphor is that the weather, the earth, or the climate is getting old. It was used often to explain changes in climate and weather patterns, as the following quotes illustrate.

*"The weather is like a human. It gets mad. It gets silent."
"The people can't be stopped, that's why the environment is having a tantrum."
"The weather gets wild even when it's not the time for it to be wild."
"The weather gets bored and we make our adjustments."
"The weather here is kind to us." [in reference to the typical climate of the area]
"The weather [pattern] changes because it is getting old. An old person changes his mind a lot."*

Personification also emerged when informants spoke of animals' lives. Certain sea animals have sentient lives, knowledge, feelings, fears, altruism, and guardian roles. These include especially whales, dolphins, sharks, whale sharks, turtles, and octopus. Fish have some of these capacities to a lesser degree. Young and old animals are qualitatively different and may react to things (pollution, heat, noise, illegal nets) differently. Larger species of fish are sometimes considered older.

Weather and Climate Change as Cyclical: The 'climate/weather change as a cycle' metaphor used by Batangas fishermen has two subtypes, (a) and (b).

- (a) The climate and the earth have a human-like life cycle with an end. This metaphor is widespread in both communities. It is connected to the 'climate/weather as human' metaphor, as in "the earth/weather/climate is getting old." It is illustrated in the following quote:

"It will end, but gradually, from hunger, from difficulties in work, in the system of work in the sea. Maybe that's what they call the end of the earth. Maybe it's almost like the earth getting old. It's normal that it gets old. It will die. It won't become young again. It will get even older. Nothing will be young again. Because the people here can't be disciplined anymore. They're hard-headed." (Bauan fisherman)

- (b) The earth's climate and the annual weather cycle are changing in a continuously turning cycle. This metaphor evokes small and large continuous cycles, and is also used to describe a fisherman's economic life.

--Weather Cycles (small)

"Ever since I was a child the weather cycled between hot, cold, hot, cold and it always returned."

--Climate and Earth Cycles (large)

"The earth turns. It's just their time to get typhoons now." [referring to people who live in areas not normally effected by typhoons, but who are now experiencing typhoons]

"The earth turns differently [now]."

[Researcher: Did the weather during your childhood get bored, too?] *"No, because that's how the environment is, it doesn't stay the same, it just comes and goes."*

"They said that the weather [climate] from before will soon return. The past will return according to the Bible."

--Fishermen's cycles (small)

"The life of a fisherman is like a wheel. Sometimes you're up, sometimes you're down."

"Every day, sometimes we have some, sometimes we don't. It goes around, returns."

Possible Features of a Cultural Model of Nature

Humans, animals, weather, climate and the earth may be linked by shared characteristics. The notion of a human steward role is found mostly among people who have been exposed to conservation education. It is stronger in Lobo where more people have at-

tended conservation seminars. The changes in weather patterns and the local natural environment people are experiencing seem to be understood in various ways:

- *The earth, like a human, has a natural life cycle and is entering the end of it*
- *The earth is returning to a previous phase in a continuous cycle*
- *In both cases, humans can do nothing about changes in weather patterns and climate (and by extension do not cause them); humans can only adjust to these changes*
- *There will come a time when the environment is “broken” beyond repair and humans won’t be able to adjust*
- *Human activities in the immediate vicinity are responsible for local environmental degradation, the depletion of fish supply, and the rise in sea level. These changes are mostly seen as inevitable. For the most part, people cannot hold other people accountable because people, corporations, and governments are just performing their roles.*
- *Filipino national character (hard-headedness) is partially to blame for local environmental degradation but it cannot be changed.*

Continuing Analysis and Next Phase

The research has made clear that full-time fishermen who operate the larger *pukotan* are more concerned with changes in weather patterns than the part-time fishermen who operate smaller vessels. *Pukot* fishing enterprises have been devastated by increasingly unpredictable weather, where out-of-season storms and winds and changes in fish stock and migration patterns have made operating and maintaining traditional *pukotan* nearly impossible. Their viability depends on predictable seasonal patterns in which the *pukotan* can operate in the bay for a period of months after having been beached during typhoon season. They don’t have the flexibility to take advantage of short periods of calm interrupted by storms. And when the vessel is launched, there must be schooling fish available for capture. Therefore, the notion expressed by fishermen in Bauan of a “broken” system means, for operators of small-scale commercial purse-seiners (*pukotan*) in places like Bauan, a broken livelihood system. While they readily point to human activities that have polluted the bay, their understanding of the relationships between climate change, environmental conditions, human activities, and other elements are nuanced and perhaps changing. What or who caused this systemic dysfunction is a topic discussed often these days in Bauan.

For the next phase of research, the cultural models of nature held by locals will be explored in further detail, as will the current changes in the climate and the environment that locals perceive with the goal of getting a clearer outline of the underlying assumptions behind local knowledge and causal explanations. Lobo will continue to offer an interesting comparative case. To what extent are different cultural models of nature differentially evoked when talking about the local setting (e.g., conditions, weather, people, and fishing) vs. global phenomena (e.g., climate change and the role of humans in general). Are the relationships between humans, the physical environment (for instance, the bay, the sea, the forest), the climate, the weather, the supernatural, and other natural elements inherently different when these fishers consider the immediate environment vs. the climate? Also, what is revealed about

the relationship between supernatural elements and luck rituals (that were once used to cope with danger and uncertainty in the context of deep-sea fishing) and the environmental degradation that is now understood to negatively impact fishing success? If supernatural elements have lost their efficacy, how is this explained?

Notes

- 1 The free listing tasks I administered in these fishing communities, which elicited word lists from informants in predetermined categories set by the research protocol (plants, animals, geographical features, weather, the supernatural, people), not surprisingly revealed a wealth of knowledge and subcategories in the area of sea life. The original categories for the listing tasks were modified spontaneously during the course of the fieldwork during successive interviews, in response to interactions with informants. The category, "animals," for example, elicited only land animals at first. Therefore a "sea animals" category was added to the listing tasks. When "sea animals" elicited mainly non-fish (dolphins, turtles, whales, etc.) and occasionally the word "fish," it was determined that fish comprised, not surprisingly, a salient category, and needed to be asked about directly. Lists of fish tended to be recalled in subgroups, the most salient of which were fish for capture and other fish, as might be expected since the majority of informants were fishermen, and secondarily, fish vendors. Combining the qualitative ethnographic observations made of this task with semi-structured and unstructured interviews reveals that many other salient categories based on a variety of criteria are contained within the fish and sea life categories and within the fish for capture/other fish categories (fish that humans should never kill, guardian sea animals, sea animals with human-like emotions, "young" and "old" fish, sea creatures legally prohibited from capture, seasonal/migrating fish, etc.). Additionally, in Lobo, a community with a healthier land habitat where many informants had close contact with an intact and/or protected forest environment (in addition to the marine environment), people naturally had more extensive knowledge of the animal and plant life within the forest compared to people in Bauan. More targeted research into these rich areas of local knowledge is called for based on this first phase of research. For this reason, the data from the free listing tasks is considered preliminary at this point and is therefore not summarized in this report.
- 2 Key word analysis of the interviews is also part of this analysis, but it is ongoing and thus not presented in detail here. Analysis thus far suggests the salience of fish, weather (especially typhoons and wind), the months of the year, and the sea among fishers in Bauan. In Lobo, interviews contained a similar set of salient concepts but with heat and rain being more salient (and wind being less salient) among these fisher-farmers. This saliency is reflected clearly in the different words used to identify the seasons depending on the main subsistence activity performed by the informant (see the section in this paper dealing with seasons).
- 3 World Wildlife Fund website. <http://www.worldwildlife.org/places/coral-triangle>
- 4 Kent E Carpenter and Victor G Springer, 2005, "The center of the center of marine shore fish biodiversity: the Philippine Islands." *Environmental Biology of Fishes* 72: 467-480.
- 5 In addition to expert knowledge of lunar cycles, seasonal winds, storm and weather patterns, and fish behavior, fishermen have used economic and organizational strategies, kinship networks, luck rituals, charms, and Roman Catholic rituals such as boat blessings.
- 6 Jocano, F. Landa, 2001. *Filipino Worldview: Ethnography of Local Knowledge*. Quezon City: Punlad Research House, Inc.