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## Madurese Fishing Community Cultural Perception of Coastal Litter

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### Abstract

Piles of litter on the beach polluting the sea have become one of the global problems at this time. Indonesia is an archipelago country whose coastline is inhabited by tribes who have been living as fishermen for hundreds of years. Therefore, it is important to understand what the cultural perception of the fishing community is regarding the litter problem. This study aimed to figure out the perception of the fishing community in Madurese culture regarding the litter on the beach. By adhering to the phenomenological paradigm, the researchers chose four fishing families in Madura, conducted semi-structured interviews and observations, as well as analyzed the data. We conducted Creswell and Poth's qualitative data analysis spiral. The found that the Madurese fishing community perceives coastal litter as (a) a physical problem, (b) a human-God relational problem, and (c) an individual-government relational problem. In short, the community's perceptions of the litter on the beach are related to their beliefs about the position of humans, nature, and God.

### Keywords

cultural perception, coastal litter, Madurese fishing community, qualitative analysis spiral

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# Madurese Fishing Community Cultural Perception of Coastal Litter

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Piles of litter on the beach polluting the sea have become one of the global problems at this time. Indonesia is an archipelago country whose coastline is inhabited by tribes who have been living as fishermen for hundreds of years. Therefore, it is important to understand what the cultural perception of the fishing community is regarding the litter problem. This study aimed to figure out the perception of the fishing community in Madurese culture regarding the litter on the beach. By adhering to the phenomenological paradigm, the researchers chose four fishing families in Madura, conducted semi-structured interviews and observations, as well as analyzed the data. We conducted Creswell and Poth's qualitative data analysis spiral. The found that the Madurese fishing community perceives coastal litter as (a) a physical problem, (b) a human-God relational problem, and (c) an individual-government relational problem. In short, the community's perceptions of the litter on the beach are related to their beliefs about the position of humans, nature, and God.

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## Introduction

Coastal litter, mainly from plastic material, is one of the biggest environmental problems today. Not only disrupting human health and aesthetic aspects, coastal litter also threatens the life of marine species because it takes a very long time for plastic material to be completely degraded (Li et al., 2016). Since 1930, plastic has become the most dominant material in the marketplace. In 2012, global plastics production had reached 288 million metric tons (Jambeck et al., 2015). Moreover, in 2018, the production had increased to 359 million metric tons (PlasticsEurope, 2019).

Incorrect management of coastal litter (reduction, collection, transport, treatment, and disposal) which ultimately pollutes the sea does not only occur in crowded areas such as tourist beaches, but also in local fishing communities. Maritime countries such as Indonesia and Chile experience this problem. Kiessling et al. (2017) found that the majority of coastal communities which are not prepared for litter management have actually realized that the litter on the beach and in the sea is their big problem, especially in posing a hazard to marine wildlife and human health, but that awareness has not been translated into environmental behavior as residents littering less, picking up litter and volunteering for beach clean-ups. As we know, human behavior is strongly influenced by their perceptions (Denzin, 1994). Thus, one way that can explain why knowledge does not produce environmental behavior is to dig deeper phenomenologically into the fishermen's perceptions of the coastal litter and who they think should be responsible for solving the problem.

Perception can simply be interpreted as how we see things. The explanation seems to be only physical and sensory. However, in the paradigm of phenomenology, perception is not

only physical but also transcendental. To be able to understand this transcendental perception, Husserl proposed a method of transcendental epoche and reduction (Dillon, 1997), which in the research tradition is referred to as the phenomenological approach.

Qualitative researchers are very interested in individual perceptions in order to understand the meaning of experience for an individual, a culture or a particular community group (Munhall, 2005). Moreover, under certain conditions, qualitative researchers prioritize perceptions over facts (Morse, 2017). In particular, phenomenology researchers view human perception to be influenced by several aspects, namely previous experience, attitudes, and goals (Spinel, 2005).

Several studies on the fishermen's perceptions on coastal litter have already been conducted. For example, Brennan and Portman (2017) found in their study that Arab-Israeli fishermen realized that plastic litter on the beach and the sea had a negative impact on them, particularly in terms of scaring the fish away and making it difficult for the fishermen when the fish were caught in the net. They also thought that children need to get an education to clean up the litter that might increase in the future. A survey conducted by Bonaiuto et al. (1996) explains that the pollution levels on the coast are influenced by the nationalism and the local identity. The people's attachment to the city or country makes them perceive that the beaches in the city or country are cleaner.

Unfortunately, there are no studies on fishing community perceptions of coastal litter that deeply explored its link to tradition and culture. In some Southeast Asian countries such as Indonesia, the traditional and cultural values still strongly influence the daily perception and behavior of the fishing communities.

Indonesia is a maritime country consisting of many ethnic groups. Some tribes, such as Bugis, Mandar, Bajo, Buton, and Madura, are known as reliable sailors (Lampe, 2016). Until now, there are still many traditional fishing communities in Indonesia, not only in terms of fishing methods but also in terms of the social and cultural patterns. In Madura, every year the fishermen hold the *Petik Laut* ceremony, which is essentially the release of sacrifices into the middle of the sea and prayers to God so that the sea still provides fish and safety for them (Primyastanto & Efani, 2013).

In the tradition, there are values held by the community because they believe that it is very important for their lives. The *Petik Laut* ceremony that is conducted by the fishing community every year requires a large amount of funds. All the community members contribute even though many of them are classified as poor. From the point the view of other societies, especially modern society who legitimize the money-economy (Melle, 1994), it is certainly regarded as something which is not productive and even harmful for their economy and autonomy. This phenomenon reveals how strong traditions and cultural values affect people's lives.

Related to the litter that pollutes the coastal environment, including in Madura, it is necessary to figure out the traditional perceptions of the fishermen community regarding the litter in their environment. Understanding their perceptions will open the possibility to solve the beach and sea pollution problems through cooperation between the government and the community.

### **Research Question**

The main question in this study is "What are the fishing community's traditional perceptions of coastal litter?"

## Research Objective

The objective of this study is to figure out the traditional perceptions of the Indonesian fishing community, especially in Madurese culture, regarding coastal litter. Through this study, the community's view is expected to be better understood, so that the government, educators, and environmentalists will find the cultural background of why the coastal litter problem in Indonesia has been difficult to handle.

## The Role of Researchers

The researchers are academics at Yogyakarta State University who have special interest in the field of environmental education. We see that the problem of Indonesia's coastal litter cannot be solved merely through an environmental approach, but should involve cultural aspects, in which the fishing community is the main actor. We must better understand their views of life before offering our help to overcome the problem. This study was conducted in order to provide the lack of scientific information regarding these worldviews.

## Research Design

The design of this research was based on the phenomenological paradigm (Langdrige, 2007) mainly because the focus of this study was to deepen our understanding of the perceptions of the Indonesian fishing community regarding coastal litter. For Husserl, perceptions which underlie the patterns of human life were not only sensory but also transcendent (Romdenh-Romluc, 2011). Therefore, exploring them required a phenomenological approach. Perception comes from the wealth of experience of each individual in a community group. In this case, it was the daily experience of the fishermen when they interacted with the litter on the beach and the sea. Therefore, the research units were the experiences about a phenomenon (Starks & Trinidad, 2007).

We construct research findings that are more general than distinctive phenomenological results and in line with generic descriptive qualitative research. We used phenomenological techniques purposely to focus more on how humans perceived or experienced their experiences, and gave meaning to these experiences (Langdrige, 2007). As expressed by Spineli (2005), human perception of objects is strongly influenced by previous experiences, settings of objects, feelings, behavior, and orientation of humans. In terms of data analysis, Creswell and Poth's (2018) qualitative data analysis spiral was employed. It includes collecting data, organizing data, reading and making memos, describing and classifying codes into themes, developing and assessing interpretations, and presenting interpretations.

The research was conducted in Lobuk, a fishing village at Sumenep Madura. We chose the village by considering its character according to the research objective. One of our team members is Madurese, born in the Bangkalan district (located within two districts from the research site). His ability to speak Madurese facilitated our team to build the initial relationship with the Lobuk fishing community. In addition, he also acted as a translator during the interviews. Our research protocol was approved by the Graduate Program of Yogyakarta State University and *Bangatowa* (local term of cultural leader of the community) of Lobuk village.

## Participants

Experience as a research unit in the phenomenological approach may provide enormous data. Qualitative studies only need a small number of samples (Starks & Trinidad, 2007). The

number of samples and interviews per individual was determined based on the research objective and the ability of the individuals to provide detailed experience.

Based on the literature review on the writings of Langdrige (2007), Moustakas (1994), Starks and Trinidad (2007), the researchers chose four couples who were considered as married couples, the core members of a fishing family, as the research participants. The main question in this study is about the fishing community perceptions of coastal litter. The perceptions are based on the daily experience of the fishermen in Indonesia during their activities and lives on the beach. For this reason, the selected fishermen are those who have culturally grown up in the traditional fishing village where the environmental condition was full of litter, before finally having a family and living independently in the same village. The criteria for inclusion in this study (to judge an individual's ability to provide detailed experiences) were that the samples should be the original inhabitants of the village of Lobuk Sumenep Madura who worked as fishermen, aged more than 30 years, and had quite a long experience as fishermen. In addition, they should also actively participate in the village tradition both *Petik Laut* and *Esseran*.

Based on the age, the participants in this study consisted of two couples whose age was between 30 to 40 years old and two couples whose age was over 40 years old. At the beginning of the study, the participants were asked for their oral and written consent. In each interview, the willingness was again asked verbally. The participants' names were changed into P1-P8 codes (the odd numbers for men and the even numbers for women) to protect their identity, in accordance with the ethics in qualitative research (American Psychological Association, 2020).

### Data Collection

Interview is one of the most commonly used methods for producing knowledge in social sciences (Brinkmann, 2017). In this study, the researchers used a semi-structured interview method, in which interviews were recorded and transcribed. In addition, field notes were made during observation, both on the initial and the follow-up observation (Guest et al., 2013). We used observation data as a secondary source, mainly to deepen our understanding about the context. Observational data was important to deepen our understanding of community's environment and culture (van Manen, 2016) as our research context. In initial observation we observed the village environment (e.g., the condition of fishing port, fish market, fishermen's house, and the beach). While in follow-up observation, based on the participants' answers about the relation of their attitude and habit to the values within their traditional ceremonies, we explored one of the community's traditional ceremonies namely the *esseran* ceremony. In addition to understanding the context which is useful for structuring questions and understanding participants' answers, we also used both observational descriptions to give our readers a better understanding of the themes we present.

Our main question in this study is: What are the fishing community's traditional perceptions of coastal litter? To reach the answers, each participant was involved in three interviews. First, we introduced our team and study, followed by questions about participants' experiences, feelings, and opinions about litter around them. Second, we conducted interviews with semi-structured and open-ended questions about their perception of the human role in the coastal litter problem and confirmed the information regarding the connection between the values of traditional ceremonies and the environmental behaviors of community (e.g., according to you what is the fishing community obligation to the sea? What about the litter?). The last interview was specifically used to solicit interviewee responses regarding the researchers' conclusions or interpretations (e.g., based on the previous interviews, we conclude the main obligation of the community towards the sea is to carry out *petik laut* and *esseran* ceremonies to thanks to God. Do you agree with it?). Each interview was conducted for 30 to 60 minutes. The interviews were audiotaped, and detailed notes were taken. Audiotapes and

notes were transcribed immediately after the interviews. To ensure the credibility of the data, the conclusions generated by the researchers were confirmed by the interviewee's responses in the third interview regarding the possibility of misinterpretations. Interpretations were presented orally in bilingual (Indonesian and Madurese languages) to avoid participants' misunderstanding. Because the interviewee's response produced contradictory feedback, we followed Braun and Clarke (2013) recommendation to note that some participants support the analysis, while others did not (with explanation why it happened). Contradiction was a concern with respect to the second theme, but not to the other, therefore we decided to keep the whole structure of the themes. Fortunately, the contradiction revealed some additional information about dynamic change of the fishing community culture. We discuss it in the discussion section.

### Data Analysis

The data analysis in qualitative research is not separated from other parts of the study, such as data collection and report writing. These sections are always interrelated and simultaneous. Creswell and Poth (2018) describe this process as a spiral which includes collecting data, organizing data, reading and making memos, describing and classifying codes into themes, developing and assessing interpretations, and presenting interpretation. Using the phenomenological paradigm as a guideline with the basic principles of epoche and phenomenological reduction (Butler, 2016), the researchers applied the stages of Creswell's data analysis mentioned earlier.

The first information we collected was from our initial observations regarding the fishing community's environmental condition. Based on it, we conducted the first interview. Surprisingly, in reading and discussing the transcripts, we saw an indication of the community environmental perception and habit connected to the values within their traditional ceremonies. Therefore, we conducted the second observation on the *esseran* ceremony, especially in order to deepen our understanding (and tried to feel their feeling) about its sacred circumstance. In the second interview we explored more about participant perception of human responsibility to nature and its relation to supernatural being. Field notes from the observations were used mainly in the initial step of the coding process. Along with interviews transcripts, we read each of them to become intimately familiar with the context of the data.

Codification was made referring to Creswell and Poth's suggestion (2018), namely the lean coding technique, by only making five to six codes at the beginning, and then expanding the code during the review and re-review. Researchers made initial codes after the second interviews were transcribed. The coding process began by obtaining verbatim transcripts and reading each transcript to gain a sense of overall content. During the readings, we found some "easy to see" statements of the participants that relate to research question (e.g., it is not comfortable to see, the sea no longer swallows up litter). Then, we coded the statements. Five initial codes were made namely disturbing scenery, feeling disgust, causing disease, the sea would not swallow the litter anymore, and waiting for the government. All the five codes were made from participant's language. Next, we reread transcripts to find the "harder to see" statements. The second type of codes were made from researcher's language (e.g., immoral humans, individual helplessness). Once completed, we reviewed the list to remove overlapping codes.

From the expanding codes, themes were then developed (by clustering the codes). According to the suggestions from Braun and Clarke (2013), they were carried out in an active process. We created potential clusters by identify similarity between codes. In addition, some related expert works regarding Indonesian traditional character (i.e., de Jonge, 1990; Geertz, 1976; 1980) also helped us to identify the potential clusters and naming themes. We discussed

and reviewed the potential clusters and made several times revision before fixed the themes. For example, Geertz's (1976) writing helped us to determined potential cluster of religious perception of coastal litter. Through internal discussions, then we changed the name "religious perception" into "human-God relational problem" based on the specific function of traditional religious ceremonies.

The arrangement of themes was then interpreted by carefully determining the meaning of the pattern or structure of the themes. Personal views of the researchers were contrasted with the construction in social science which became a major part of our interpretational process. We determined three themes regarding Madurese fishing community perceptions of coastal litter namely as a physical problem, human-God relational problem, and individual-government relational problem.

Creswell and Creswell (2018) offer several methods for validating a study. In this study we applied three methods. First, we used multiple sources of data to build themes, interview transcripts as primary data and observation field notes as secondary data. Next, we used member checking by taking our major findings to the participants. We conducted this procedure in the third interviews. Finally, we presented negative or discrepant information, especially when some of our participants did not agree with the perception that the sea swallows all litter (in the second theme). Creswell and Creswell (2018) stated that discussing contrary information adds to the credibility of the findings.

In presenting the research findings, we followed Chenail's (1995) suggestion to present the data in a natural shape. We described the community condition, which was obtained from observations, before their perception of coastal litter. Themes of the perceptions then were presented in most simple to most complex strategy, so that data presentation is easier to understand.

## Findings

This study was conducted in the fishing village in Lobuk, Sumenep, Madura. The traditional aspect of the village was seen especially in the conversation about the traditional ceremonies. The researchers noted that there were two rituals, the *Petik Laut* ceremony which was held once a year, and the *Esseran* ceremony which was carried out at the beginning of each monthly period of fishing. Fishing was carried out using boats equipped with propellers using movers from the solar motors. The decision of the fishing time was based on the weather conditions and the moonlight. They would go fishing when it was *pettengan* (a local term for the sky with no or just a little moonlight).

There was a division of tasks in the daily lives of the fishing families. The husband was in charge of fishing while the wife was in charge of household activities, such as cleaning the house, cooking, taking care of the children, and managing the fish caught, such as drying and selling the fish. Their children helped the work of their parents according to their gender. The boys helped the fathers while the girls helped the mothers.

Every year, the fishermen carry out the *Petik Laut* ceremony, which is a ceremony of gratitude to God for the various seafood they receive. They believe that the gratitude to God will bring salvation. In addition to the big annual ceremony, the fishermen also pray together on a boat by inviting a *Kyai Ngaji* (a local term for people who teach children to read the Qur'an) at the beginning of each monthly fishing period. This ceremony is known as *Esseran* (see Figure 1). At the *Esseran* ceremony, the fishermen's wife (see Figure 2) prepare food for people who pray and the offerings consist of flower water, chicken head rice, chicken feet rice, and five-color porridge (white, yellow, green, red, and black).



**Figure 1**  
*Esseran ceremony*



**Figure 2**  
*A fisherman's wife prepares food and offerings for Esseran ceremony*



In initial observations of the village environment, the researchers observed that the village and beach were filled with litter, especially plastic litter (see Figure 3). In a traditional world, most organic wastes would be degraded rapidly. Therefore, the fishing community's habit of disposing litter into the river or the sea was not a big environmental problem. Yet in a plastic era, it brings a different condition. Piles of litter stay around the coast and sea water for a long time. Of course, it led us to a big question; what do they think about that litter? In this study we explored and found three perceptions.

**Figure 3**  
*Piles of litter in fisherman village*



### **Theme 1. Coastal Litter as A Physical Problem**

From the interviews, The informants explained that the negative feelings arose from the every day experience of what they see and their interaction with the accumulated litter on the beach. There were no informants who mentioned positive or neutral feelings during the interview. There are two main things that lead to negative or uncomfortable feelings, namely disturbing scenery and bad experiences caused by litter.

#### ***Disturbing Scenery***

The first thing that appeared in the interview when the participants explained about their feelings was disgust and discomfort. Litter that piles up on the beach and also pollutes the sea makes the scenery unpleasant. This is stated by P2 in the following excerpt: “Disgusting, it makes our eyes sore!”

Another statement was given by P7: “On television, the beach is mostly beautiful. But here, it is not comfortable to see.”

#### ***Bad Experiences Caused by Litter***

In addition to disturbing scenery, participants also mentioned some bad experience caused by litter such as mosquitoes in the house and its surroundings, as well as diseases suffered due to mosquito bites such as dengue fever. The following excerpt is P3's statement regarding his bad experience:

Hmm. . . Lots of mosquitoes at night. If they pass the litter, they continue to smell like a tub. Plus, there are many people who are affected by dengue fever. I was treated at the hospital because of being bitten by mosquitoes.

The following is a statement by P8: “Actually, our home is a bit far from the litter. But the smell and mosquitoes still come to interfere.”

## **Theme 2. Coastal Litter as A Human-God Relational Problem**

The participants believe that the main cause of coastal litter was the problem of their relationship to God. It was indicated by two phenomena namely the sea does not swallow the litter anymore and ungrateful and immoral humans.

### ***The Sea Not Swallow the Litter Anymore***

What is the reason within the community habit to throw litter into the river or the sea? Madurese traditional people, including the fishing community, are known as religious people (de Jonge, 1990; van Bruinessen, 1995). The character is commonly expressed through daily activities and practical knowledges. For example, they believe that a lot of fish is an expression of God's mercy, while the storm is an expression of His anger and nature is the manifestation of God's power. In this research, surprisingly participants also explained the same thing related to coastal litter. The sea has a power to swallow all the litter, as an expression of God's power to preserve human life. The following is the statement given by P1:

It must be drowned by the sea water. When the tide is high, the litter will move, carried by the water into the middle of the sea. Yeah, the litter will go into the middle of the sea, and then later, the litter in the area will be cleaned because of the sea water exposure. Thanks God.

Another question was then raised: Why the beach is full of litter? The fact is participants still believe in the power of the sea. The following is the answer given by P2: "Mmm yeah . . . The sea no longer swallows up litter. It just shows that God (Allah) is warning us."

It should be noted, some participants disagreed with the perception of sea power to swallow all litter. For them, it just moved to another place, floating on the sea. But they agreed with the obligation to thank God and do all the traditional ceremony. The following statement is given by P5: "Staying on the sea won't change that. The litter will continue to grow and cause water pollution. It keeps floating on the sea. Most just moved because of the waves."

The contrary perception reveals an indication about dynamic changes in some part of the community, especially their environmental knowledge. We will discuss this more in the next section.

### ***Ungrateful and Immoral Humans***

In relation to God's protection and mercy, the Madurese fishing community believe that they have an obligation to conduct traditional ceremonies as a collective expression of gratitude to God. The following statement of participant (P4) shows the reason within traditional ceremonies.

Whether or not there are fish in the sea, it has been arranged by Allah SWT. Likewise, He protects us from a lot of problems as litter, disease, or storm. The fishing community is only trying to fulfill the obligation to the sea in the form of sea offerings, such as *Petik Laut* ceremony every year. Indeed, *Petik Laut* and *Esseran* are the ceremonies organized by the fishing community to save the sea so that there are always plenty of fish and it will also keep the community safe.

P5 states, “Currently, many disasters have befallen Indonesia. Tsunami, no fish, disease, and dirty sea . . . It’s all because humans are ungrateful and immoral (in local terms, *maksiat*, which means violation to God commands).” Related to human obligation to conduct traditional ceremonies, participants still believe in the obligation. The following statement of P1 is an example regarding their belief: “The obligation remains an obligation, we keep doing it. Otherwise, there will be even greater problems and disasters.”

Madurese fishing community members believe that natural problems or even disaster indicates the problem of their relation to God. Things that led to the problems are the lack of gratitude and human violation to God commands (immoral). This attitude according to Bankoff (2004), called the faith of vengeful God, would direct the community to passively accept a fate beyond their control. However, it is different for Madurese fishing community because there is still another manifestation of God’s power, the government.

### **Theme 3. Coastal Litter as an Individual-Government Relational Problem**

The participants perceive that they cannot overcome the problem of coastal litter without government direction, which indicates that another cause of coastal litter problem was their relationship with the government. This perception was indicated by two reasons namely individual helplessness and waiting for government stricter action.

#### ***Individual Helplessness***

Praying individually or in a collective ceremony is not the only obligation. In order to overcome natural problems, the Madurese fishing community believes that they should do something to struggle. Madurese people are well-known as the most active Indonesian ethnic group. In order to cope with the extreme condition of their homeland, for centuries they migrated to other areas of Indonesia (Husson, 1997). With regard to the coastal litter problem, participants told about people’s effort to overcome it. In fact, individual efforts to burn it, cannot resolve the problem. The following is a statement from P7:

It is no surprise that the litter piles up if there are so many people littering there every day. There will be a lot of litter in less than a week. When that happens, people will burn it, but then it piles up again in no time. In the past, my parents used to burn the litter or throw it into the river or the sea. That was why it piled up and there were a lot of litter in the environment, perhaps it was a habit, just following the old generation.

In relation to previous statement, the following is statement from P8: “Ordinary people could not possibly handle it, piles of trash everywhere. Little can burn because it’s wet. Unless transported by government’s big trucks, like the one on TV.”

The statement reveals participant perception that individual efforts (i.e., burning the litter) would not overcome the problem. For this reason, they considered that only the government has the power to make changes for a clean beach and sea.

#### ***Waiting for Government Stricter Action***

The participants stated that they have a great expectation on the government’s power. In other words, they are waiting for government action. The following is the statement from P6: “Yes, hopefully the litter will disappear later. Hopefully, there will be government officials who clean up so that the environment here can be clean again. If there are stricter regulations

and controls, people will follow. *Bhupa' bhabhu' guru rato.*" P5 continues with another statement: "Actually, on TV, there is a recommendation from central government to save the environment. But it's useless if those who are here (the local government) not directly lead and organize the community."

The local wisdom *bhupa' bhabhu' guru rato* means that people should obey their parents, teachers and the king (or the government). The Madurese traditional fishing community believes that the government is a representation of God's power on earth, with the right to govern people and nature. Another example of statement which indicate the community perception of the government as representation of God's power is given by P3:

Yes, it should be. The government is destined to govern, the commanders (local terms: *tokang parenta*). Managing the land and the sea are their job. We as ordinary people must obey and carry out what is ordered . . . It seems that now there is a lot of chaos in the government, but later God will bring order.

### Discussion

The first finding regarding the negative feeling on the litter which has been felt by all participants has confirmed similar findings from the study of Brennan and Portman (2017). The Madurese fishing community, like the fishing communities in other countries, experienced negative things in their lives related to the presence of litter on the beach in terms of disease, odor, and fish availability. Other findings that show community perception regarding human, nature, and God relations contribute to the literature on spirituality of the traditional community in living with their environment (Aikenhead & Ogawa, 2007; Hewson, 2015; Salmón, 2000).

Understanding people's perceptions, attitudes, and behaviors are crucial stages in the efforts to tackle litter problems (Hartley et al., 2014). Religiosity in traditional societies, as well as the character of Madurese society (de Jonge, 1990; van Bruinessen, 1995), greatly influence their perceptions and attitudes towards nature. Our findings show that the Madurese fishing community's habit of throwing litter into the river or the coast comes from their beliefs about nature (the sea), an embodiment of the power of God who not only can provide fish and natural products for humans, but also can overcome the problems in its body. The human responsibility in this case was to thank God. One way to do it was by carrying out traditional ceremonies. The problem in relation to God will lead to more natural problems or even disaster.

This view is related to one of the characteristics of traditional knowledge about nature, namely the spiritual character (Chiang & Lee, 2015; Holst, 1997; Ogunniyi, 2004). That is, all natural mechanisms take place as manifestations of God's power and purposes. Events in nature can be the manifestation of God's love, but at different times they can be the manifestations of His wrath. In this view, it is logical for people to believe that prayers and expressing gratitude to God will have a direct impact on natural events around them. *Petik Laut* and *Esseran* are similar to *Slametan* (i.e., praying and eating together in order to express gratitude to God). The *Slametan* ceremony has been studied and widely discussed by Geertz (1976).

In contrast to Bankoff's (2004) analysis (i.e., spiritual character directing the community on the passive attitude to accept the fate beyond their control), we found that the Madurese fishing community believes that their responsibility is not only to thank God but also to do something to overcome the litter problem (e.g., burning it). Unfortunately, they were individually helpless in facing the old habits of the people who like to throw litter on the beach. According to them, only the government has the power to conduct a beach cleaning program. In other words, they are waiting for the government together with the community to solve the problem. This condition confirms the findings of the study conducted by Brennan and Portman (2017) on Arab Israeli fishermen, who explained that long-term handling of litter on the coast

would be difficult to do if there was no transformation of relations between the local communities and the government institutions. This study provides further input that the government should also pay attention to the traditional views of fishing communities to be able to establish positive relationships and make them actively participate in the litter-free beach program.

The difference in views regarding the sea's ability to swallow all litter shows a condition which Heine (2015) referred to as the process of cultural evolution through the dissemination of ideas. The second group, those who understand that plastic litter will not be destroyed when it is drowned into the sea, are those who have interacted with modern scientific ideas about the human power to explore and manipulate nature. The interaction begins to change the initial perception as has been believed by the first group, that the sea is spiritual, a representative of God's power, and is beyond the reach of human power.

The development of modern science and its spread throughout the world have been shown to decrease dependence on traditional knowledges (Reyes-García et al., 2013). The Madurese, like other Indonesians, have interacted with modern science ideas mainly through schools and information technology. However, it seems that in the case of the Madurese fishing community, the old culture is still dominant in controlling the people's behavior including the habit of disposing litter on the beach. The religious belief held by the community, which is contrary to the anthropocentrism of modern science, seems to be a strong enough barrier for cultural change (Harper & Leicht, 2018) related to beach litter management. It is consistent with the findings of Diener et al. (2011) that religion is an important part in the lives of most of the world's population.

The Madura fishing community's belief that the government has the power to overcome the litter problem actually could not be separated from the traditional view of Indonesian people in general. Indonesian traditional society believes that the country has a sacred power, representing the power of God on earth (Geertz, 1980). The formation of a modern democratic country does not seem to have completely diminished the traditional view of society regarding the absolute and sacred powers of the country.

The research surprisingly shows us about the existence of traditional values (not only the ceremonies) in the modern science dominating era. It has opened new insight about the complexity of traditional community environmental problem. The findings suggest that improvement of beach litter management in Indonesia, especially Madura Island, needs a more suitable government-fishing community cooperation system. Similarity of spiritual values within traditional ceremonies of Indonesian Island ethnics, for example Javanese (Geertz, 1976), Bugis (Acciaioli, 2004), and Bajo (Stacey, 2007), have increased our confidence about a sort of transferability across the findings. Further research on this topic is required.

## **Limitations**

The findings should be understood with several limitations. The participants were four married couples in order to accommodate men and women's voices, in addition of their role as core members of the fishing family. Unfortunately, local custom prohibited a married woman to meet researchers separately from her husband. Therefore, each person was interviewed in front of his or her mate. This arrangement probably revealed some interference for interviewees to provide an individual female experience. We attempted to limit this limitation by constructing gender-related questions (e.g., litter production during fishing activity for men or drying fish for women). Fortunately, the mate's presence during the interview created a less intimidating condition than speaking just to researchers. A second limitation is regarding the small number of participants. We attempted to reduce this limitation by conducting open-ended and bilingual interviews in order to obtain detailed information.

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