Synergy between myth and local wisdom in ecology balance of climate change in Java, Indonesia

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Abstract. Myth does not always receive a negative stigma in life, because some myths are built as effective communication media from generation to generation in environmental conservation. This research describes how myths and local wisdom synergize to build ecological balance in adapting to climate change. The research method is qualitative with an ethnographic approach. The research was carried out on the slopes of Mount Lawu, precisely in Genilangit Village, Poncol Sub-district, Magetan Regency, a region where many myths and local wisdom exist in environmental conservation. The results show that the synergy between myths and local wisdom has contributed to ecological balance. The synergy is shown in the form of values, norms, and customs that are applied to the daily lives of local people in adapting to climate change.

1. Introduction
Research conducted in Northern British Columbia and Southeast Alaska, that this coastal region a very dynamic and resilient socio-ecological system in which Indigenous Peoples have existed adapting to climate change and biodiversity for thousands of years. Traditional Ecological Knowledge (TEK) their communities able to cope with climate change [1]. A cultural approach that takes into account that traditional values will become increasingly important because of considerations of ecological balance [2]. The village of Genilangit is situated on the slopes of Mount Lawu, an area where numerous myths and local wisdom have developed in the community, the interaction between nature and the environment, and especially when adapting to climate change. Sen [3] explains in his research that management of Traditional Ecological Knowledge (TEK), which is friendly to local culture and has the potential to protect the sacred gardens of India is essentially a traditional method of biodiversity conservation. Various cultural rituals and religious celebrations are practiced to protect plant species that can be referred to as a treasure house for these species.

Folk tales can be understood as a cultural expression of a community through spoken language that relates directly to various aspects of the culture and social value structure of a community. Folk tales, which are a part of folklore, are a form of oral literature that is connected with the environment, whether it be the social or natural environment [4]. Endrawarsa [5] explains that the environment essentially needs literature to solve the problems contained therein. These problems may be those that are frequently encountered in connection with the living environment, or the environment may be a factor in the emergence of problems connected to the community’s belief in the supernatural (myth).

According to the ritual-myth theory, the existence of myths is closely tied to rituals [6]. This theory claims that myths arose to explain rituals [7]. This claim was first made by William Robertson Smith [8]. According to Smith, people first began to practice a particular ritual for reasons unrelated to a
myth; subsequently, after forgetting the real reason for performing the ritual, they tried to preserve the ritual by creating a myth, and claiming that the ritual was performed to commemorate an event described in the myth [6]. Anthropologist James Frazer has a similar theory. Frazer asserts that primitive human beings began to believe in the laws of the supernatural; later, when people started to lose their belief in magic, myths about gods were created, and it was claimed that these ancient magic rituals were religious rituals performed to bring pleasure to the gods [9].

The presence of myths that have become ingrained in a social environment provides unique functions in the life of the community. Van Peursen (in [10]) divides these functions into several groups. In the main function, myths play a role in making people aware of the existence of supernatural powers that live alongside them. In the second function, myths provide assurance of the present day. In the third function, myths contribute to knowledge about the world, whether it be knowledge about the creation of the universe or the creation of gods. The important function of myths is to build a behavioral model [11][12] and provide a religious experience. By telling or enacting a myth, members of a traditional community can feel that they are free from the present and have returned to the mythical age, which brings them closer to the divine being [11][12]. Research about myth in Korea shows that stories about dragons have become used as the name of a waterfall-Nine Dragons Waterfall; as the symbol of a king and his power-Kyungbok Palace; as spiritual/religious symbols, names of temples, films, D-War 2007, and for interpreting dreams [13].

Lauri Honko asserts that in a number of cases, communities will revive a myth to recreate the atmosphere of the mythical age. For example, they may reenact a healing procedure from ancient times in an attempt to heal a person in the present day [12]. In a similar vein, Roland Barthes suggests that modern culture explores religious experiences. Since it is not the job of science to enforce human morals, religious experience is a way to connect with moral feelings of the past, which contrast with the world of technology in the present age [14].

Joseph Campbell states that myths have four main functions: the mystic function, to interpret admiration for the universe; the cosmological function, to explain the form of the universe; the sociological function, to support and validate social order; and the pedagogical function, to teach human beings how to live in any circumstances [15]. Taking as a starting point the importance of myths in life today, the goal of the current research is to describe how myths and local wisdom synergize to build ecological balance in adapting to climate change.

2. Research method

The approach used in this research is a cultural ecological approach. This approach was chosen because literature, culture, and the environment are three things that all play an interconnected role in human life [4]. The research was carried out on the slopes of Mount Lawu, in Geniliangit Village, Poncol Sub-district, Magetan Regency, in the Province of East Java. The reason for choosing this location was because of the large number of myths and local wisdom that exist in this place in relation to environmental conservation, specifically in adapting to climate change. The majority of people understand and feel that there is an erratic seasonal change in their environment. However, they do not understand the term change in global terms. The changes that occur have several impacts, such as: (a) all regions of Indonesia experience an increase in air temperature, at a lower rate than the subtropical areas; (b) the southern region of Indonesia will experience a decrease in rainfall, while the northern region will experience an increase in rainfall. Changes in rain patterns cause changes in the beginning and length of the rainy season. In the southern part of Indonesia, the shorter rainy season will make it difficult to increase the cropping index (IP); no shorter-lived varieties and no irrigation network rehabilitation are available. The increase in rainfall during the rainy season causes the frequency of flood events, while the decrease in rainfall during the dry season will increase the risk of drought.

The community experiences difficulties and is no longer able to predict when the rainy season, dry season, or high tide will occur. As well as how long the season will last, the research uses a qualitative method with an ethnographic approach. According to Daymon and Holloway [16], this method is associated with the subjective nature of social reality. This social reality is exhibited by the existence
of myths and local wisdom that have grown and developed in making adaptations to climate change. The research is in the form of a case study, defined by Yin [17] as an empirical inquiry, which investigates the phenomena of myths and local wisdom that play an important role in adaptation to climate change.

The data sources in this research refer to Moleong [18] and Bungin [19], who explain that a data source is the subject from which the data is obtained. The data sources in this research are: first, the primary data, which is the data obtained through direct observation and from the results of in-depth interviews with community figures in Genilangit. Second, the secondary data, which is the data used to support the primary data. The secondary data was obtained from indirect data sources that were able to provide additional data or reinforce data about myths and local wisdom existing in the community which create ecological balance in adapting to climate change.

The research data was obtained through in-depth interviews, observation, Focus Group Discussions, and relevant document analysis [20][21]. The documentation for this research was primarily the collection of documentation required to support the research data, and the above-mentioned techniques are all basic techniques used in qualitative research [21]. The researcher used the four methods of triangulation proposed by Patton [22], namely (1) data triangulation, (2) methodological triangulation, (3) researcher triangulation, and (4) theoretical triangulation. The unit for analysis in this research focused on the collective action of the community in adapting to climate change, and the analysis technique used was therefore single case analysis. According to Miles and Huberman [23], in single case analysis, for each case, the analysis process is carried out using an interactive model of analysis. In this model of analysis, the three components of the analysis are data reduction, data presentation, and drawing of conclusions or data verification.

3. Results and discussion

3.1. Myth: a communication strategy in preserving ecological balance

Myths are constructed as tools a highly effective communication strategy that serves as a reminder or warning for people in their interaction with nature and the environment. Myths that develop in a community are not always negative; there is also a positive side when a myth grows and develops in a community. Humaeni [24] stresses that myths are viewed as something that people need to search for clarity about nature, the environment, and their history. Sunardjo [25] aslo writes that according to Javanese cosmology, mountains are regarded as a haven and a home for spirits. Hence, the presence of myth is extremely important for human existence and human life. Ecological balance may be disturbed if there are changes such as a decrease in the function of certain components that may cause a break in the chain of the ecosystem.

Several myths have developed in the community living on the mountain slopes that are related to ways to preserve ecological balance. First, myths about spirits that dwell in and guard the forest. One example is the king of the forest, Harimau Lawu. Its appearance is often followed by mystical events such as the discovery of a corpse. This message and this myth are warning symbols that human beings should help one another in a joint effort to preserve ecological balance, by not causing damage to the natural environment but willing to take care of their social environment. This myth implies that the community will benefit or will never be disturbed by this forest keeper.

This is in line with MacKinnon, who writes about the role of such supernatural creatures or spirits in guarding a forest, even when in reality there is no keeper of the forest [26]. The values of the messages contained in such myths make a valuable contribution to ecological wisdom for the community in preserving ecological balance. According to Endraswara [27], myths that are involved in a superstition can help strengthen the faith of the communities where the myths are found. A person’s belief in God will become stronger from the story of the myth. Myths that contain messages about belief in certain prohibitions and regulations indirectly serve to monitor the morals in the nearby social environment.
Second, myths about large trees where spirits dwell. Since ancient times, ancestors of the community have taken good care of large trees and refrained from chopping them down, for fear of bad fortune if they cause damage and make the keeper of the tree angry. Such myths have developed particularly in contexts of large trees where there is a natural spring nearby. The message of these myths is that people should not chop down or damage the trees because the trees are believed to possess an abundance of water for life. The existence of these myths makes people afraid to damage large trees.

Third, myths about the prohibition of hunting certain creatures such as the Kiyongko, the Jalak Lawu (Lawu Starling), snakes, and several other birds. With these prohibitions, the continued existence of these mythicized creatures will be ensured, as will the natural ecosystem. It must not be killed or disturbed. Anyone with bad intentions or ill may meet a sorry ending by getting lost in the forest in Mount Lawu or suffering another misfortune.

Fourth, myths about ceremonies for safety or well-being. Until now, communities living in and around Mount Lawu continue to practice and adhere to the importance of these ceremonies. The purpose of the ceremonies is to protect the local community from misfortune or the greed or unlawful deeds of others. The essence of these myths is to ask God for protection so that the surrounding natural environment where people interact with one another and with other creatures is kept safe from any damage.

The existence of these myths has ultimately led to positive, moral behavior to preserve the ecological balance. This coincides with the results of research by Pratiwi [28] who finds that the cultural values in the myths that exist in the Mount Lawu area include: (1) didactic values in the form of religious teachings, servitude to the king, heroism, and teachings about self-perfection; (2) ethical values in the form of causal relations, namely that good deeds will be repaid with good while bad deeds will be repaid with bad, as well as the aspect of obedience; (3) religious values in the form of the portrayal of attitude in carrying out religious principles.

3.2. Local wisdom of the mountainside community in environmental conservation

The internalization of the ecological values contained in local wisdom can help create human awareness in managing the natural environment, which will help form a good ecological attitude. This corresponds to research by Kongprasertamorn [29], who explains that the internalization of local wisdom in Thailand in environmental management is very helpful for preserving the sustainability of human life. Local wisdom still exists in Thailand because of the binding norms in the life structure. This is similar to the findings of Sedikan [30], asserting that local wisdom is connected to the life patterns of the local community in the way people form relationships amongst themselves, with other individuals as social beings, with nature, and with the Creator. Erwinantu [31] studied the Badui community, who believe themselves to be a part of the universe. As such, they must always guard and preserve existing natural resources.

The ecological perspective of the community demonstrates the action (interaction and interrelation) between the local community and the environment. Sumaatmadja [32] states that the environmental elements involved in this relationship of interaction and interrelation include the physical environment, the social environment, and the cultural environment. It is in this context that forests and fields are so vital, and may even be said to be a sign of the origin of a life cycle. In patterns of local wisdom that are concerned with the unity of life with the natural ecosystem, there are spiritual, ecological, economic, and social dimensions that exist side by side and cannot be separated from one another. Table 1 below indicates demonstrates the impact of local wisdom values on environmental conservation.
Table 1. Values of local wisdom and their impact on environmental conservation.

| No | Value of local wisdom                                      | Role in environmental conservation                                                                 | Impact                                      |
|----|------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------|
| 1  | Living in harmony with nature                             | Positioning oneself as an inseparable part of nature and showing respect to nature                   | Environmental sustainability               |
| 2  | Communal property resources                               | Taking care of natural resources together.                                                         | The emergence of a communal obligation to take care of natural resources and the environment |
| 3  | Utilization and conservation                              | Maintaining diversity                                                                             | Balanced ecosystem                          |
| 4  | Knowledge Systems of the local community used in problem-solving | Solving problems encountered in utilizing limited natural resources                               | Utilizing natural resources based on need |
| 5  | Adaptability in the use of technology                      | Using location-specific technology                                                                | Simple, efficient, and energy-saving technology and conservation of energy |
| 6  | Altruism in the distribution of product yields             | Building a mechanism for (equal) distribution of product yields or jointly owned resources that can prevent the emergence of discrepancy | Equalization and distribution in product yields |
| 7  | Proper management of natural and environmental resources   | Avoiding forest pillaging and damage, preserving water sources, and maintaining a balanced ecosystem | Preservation of natural water sources       |

Data source: Data analysis through in-depth interviews, 2020.

Table 2. Forms and types of adaptation to climate change.

| Field of climate change | Forms and types of adaptation to climate change | Form of Adaptation | Type of adaptation |
|-------------------------|--------------------------------------------------|--------------------|--------------------|
| Field of food production| Planting plants for shade                         | Anticipative       |                    |
| Field of water sources  | Planting trees for conservation                   | Anticipative       |                    |
| Field of environmental health | Optimizing utilization of land in home yards to grow horticultural plants for a “living store” | Reactive           |                    |
| Field of water sources  | Developing plant diversification                 | Anticipative       |                    |
| Field of environmental health | Planting with an inter-cropping system           | Anticipative       |                    |
| Field of environmental health | Planting plants that are tolerant to heat         | Anticipative       |                    |
| Field of water sources  | Cleaning irrigation channels                      | Reactive           |                    |
| Field of environmental health | Installing piping on farmland                    | Anticipative       |                    |
| Field of water sources  | Reforestation of critical land                    | Anticipative       |                    |
| Field of environmental health | Cleaning land affected by landslides             | Reactive           |                    |
| Field of water sources  | Considering certain places to be sacred, such as large (banyan) trees, for water conservation | Anticipative       |                    |
| Field of environmental health | Planting trees that can store large amounts of water | Anticipative       |                    |

Data source: Analysis of primary data through in-depth interviews, 2020.
3.3. The synergy of myths and local wisdom in adapting to climate change

Collective action to adapt to climate change in this case refers to the action of a community or ecosystem to minimize the negative effects of climate change. The synergy between myths and local wisdom has the potential to build togetherness and powerful solidarity in taking action to adapt to climate change, both in a reactive and anticipative way. Table 2 presents a summary of adaptation to climate change based on the synergy between myths and local wisdom.

This synergy model between myths and ecological local wisdom can build a collective action in adapting to climate change. The mysterious and fascinating nature of the meta-empirical realm becomes the content of the experience itself. The empirical realm is always infused by the supernatural. Hence, everything that is present in nature, whether hills, mountains, or rivers, is inhabited. This is why nature is sacralized. Nature is sacred, and as such it must be guarded and preserved, since if nature is not guarded and preserved, its balance may be disturbed, especially if human beings do something that goes against their role and position, in which case harmony may give rise to disharmony, or even disaster. Local wisdom itself continues to grow and develop in line with the dynamics of the knowledge of the community [33]. This is strengthened by the results of research by Hanif [34], which shows that local principles have the potential to become sources of learning. Therefore, local wisdom is an important aspect of building collective action to adapt to climate change. Below is a model of synergy between myths and local wisdom in adapting to climate change (Figure 1).

![Figure 1. Model of synergy between myths and local wisdom in adapting to climate change.](image-url)

4. Conclusions and suggestions

Myths are constructed as tools that are highly effective as communication strategies and serve as a reminder to people in their interaction with nature and the surrounding environment. The internalization of ecological values contained in local wisdom can help awaken human awareness in the management of the natural environment, and help to form a good ecological attitude. Collective action in adapting to climate change refers here to the action of a community or ecosystem to minimize the negative effects of climate change. The synergy between myths and local wisdom can build togetherness, cooperation, and solidarity, encouraging people to help and do well to one another, trust one another, and participate in every event organized by the village, and especially to engage in
collective action to adapt to climate change, whether in a reactive or anticipative way. In the future, people must continue to adapt to climate change with increasingly limited energy resources and other natural resources. A cultural approach and traditional values will become more important due to considerations of ecological balance.

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