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Proceedings of the 6th International Conference on Science, Education and Technology (ISET 2020)

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International Conference on Science, Education, and Technology (ISET 2020) is an international refereed conference dedicated to promoting the acceleration of scientific, technological innovation and the utilization of technology in assisting the pedagogical process. This is an annual international conference which a continuation of the previous four conferences. 6th International conference is now more focused on the emerging sciences and technologies and also the integration of technological innovation in assisting the pedagogical process. The theme of ISET 2020 is a Digital Transformation in Science, Technology, and Education for sustainable human quality development.

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The emerging era of industrial revolution 4.0 embraces the integration of artificial intelligence, machine learning, and big data into every aspect of life including education. Education is parallel to every other element of life in our community. It must adapt immediately by incorporation of the information and technology in education. Otherwise, it shall perish during the industrial revolution 4.0 as software or computer programs could easily replace educational staffs in the school. Therefore, this issue has become the central issue for The 6th International conference on Science, Education, and Technology (ISET 2020).

The 6th International conference on Science, Education, and Technology (ISET 2020) is an international seminar and a scientific collaborative forum organized by the Graduate Program of Universitas Negeri Semarang. ISET 2020 invites researchers, practitioners of industrial sector, public and private stakeholders, educators from various fields come from different countries to exchange and share knowledge. More specifically, ISET 2020 is expected to provide acceleration of technology and innovation, progression of industry and economic growth, solve multidimensional crisis, and enhance education reformation.

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Local Wisdom To Anticipation Of Climate Change In Lerep Semarang

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Abstract---Local wisdom to conserve environment including to anticipation of climate change. Lerep Village, West Ungaran Sub-District, Semarang the society have local wisdom to the efforts for conserve environment. The purpose of this research was to analyze the form and meaning of local people's wisdom as an effort to adapt to climate change. Qualitative research with the phenomenological approach was chosen to reveal the meaning of the concept of experience based on the awareness of a community. The research subjects were farmers, while the object of research was local wisdom related to climate change. The data collection was conducted through observation, documentation, and interviews. Meanwhile, the qualitative analysis was conducted through reduction, data presentation, and making conclusions. The results showed that local wisdoms found in Lerep Village, namely *tunggu kudu wareg*, *iriban* and *kadeso*. *Tunggu gunung kudu wareg* as an effort to increase community income with agroforestry systems through plantation crops. *Iriban* as an effort to clean the flow of springs to avoid drought during the dry season and floods during the rainy season. *Kadeso* as a form of gratitude for the community's harvest by observing the earth so that the food needs of the people of Lerep Village are fulfilled.

Keywords: agriculture, climate change, local wisdom

I. INTRODUCTION

Climate variability and change as a result of global warming is one of the most important challenges of the third millennium. Several new pieces of evidence from recent studies show that anthropogenic factors, especially the rapid industrial development over the past 50 years, have triggered significant global warming (Surmaini, et al, 2011). Climate change is believed to adversely affect various aspects of life and the development sector, especially the agricultural sector, and it is also feared that it will bring new problems for the sustainability of agricultural production, especially food crops.

Various problems that arise are not only caused by nature but also by human factors that do not yet have the awareness to protect the environment. To build the realization of environmental conservation awareness and behavior, the potential of

local wisdom values needs to be understood by the community in environmental management.

Local wisdom is defined as local ideas that are wise, have good value, embedded, and followed by community members (Juhadi, 2018; Setyowati, et al, 2012). Moreover, local wisdom is a system in the order of social life, politics, culture, economy, and the environment that lives in local communities (Thamrin, 2013). Meanwhile, distinctive local wisdom is considered as an adaptation strategy for the environment. With local wisdom, a community can survive and live their lives well (Permana, Nasution, & Gunawijaya, 2011). Furthermore, local wisdom prevailing in a community can have a positive impact on the community in dealing with and responding to disasters that come.

Chaiphar researched and learned about the sustainable environment in the form of management and protection of natural resources. On the other hand, community knowledge management is divided into two types, namely knowledge management from internal communities, such as knowledge exchanged between community members; and external community knowledge management, such as the exchange of knowledge between communities. In developing community practices, the community participates in groups to produce handicrafts. This research is the same as researching local wisdom and environmental sustainability (Chaiphar, Sakolnakorn, & Naipinit, 2013).

Lerep village has the value of local wisdom which is the foundation of the village. *Tunggu Gunung kudu wareg* should be made as a joint effort of the Indonesian people in social life and protecting the environment. Besides that, cooperation is also one of Indonesia's distinctive cultures which is full of noble values, Therefore, it is very necessary to be maintained (Anggorowati and Sarmini, 2015). Thus, the young generation must be prepared to be able to preserve and internalize the values of mutual wisdom that characterizes the community. Amid technological advancements such as modernization and globalization, Indonesian youth must understand values in social life to develop their identity.

The spirit of cooperation among adolescents can grow in several ways, one of which is high solidarity with the environment and others, and revive the spirit of togetherness. Lerep Village is a hilly area with the highest surface, namely *Dusun Indrokilo*. Global warming and dry season cause agricultural difficulty. Water shortages are an obstacle in agriculture, especially during the dry season. Sumariyadi stated that at this time the springs in the village experienced a decrease in water discharge during the dry season so that the water was greatly reduced. Therefore, farmers in Lerep village opt to use the rainfed system as an alternative.

The village community has local wisdom that can become a part of their lives. They have empirical facts-based knowledge in managing the environment in their area. The Lerep Village community has the value of local wisdom practiced by young people. Based on the observational data obtained by the author in Lerep Village, some people still participate in or play a role in local wisdom in maintaining the cleanliness of the home environment and village development. Lerep village often conducts environmental cleanup activities. Local wisdom has a very important value to be preserved, maintained, and applied in the life of the Lerep Village community. Based on this information, it can be seen that Lerep Village still preserves and applies local wisdom in village development and environmental management. The purpose of this study is to analyze the shape and meaning of local people's wisdom as an effort to adapt to climate change.

II. METHODS

This study applied qualitative research to obtain data about local wisdom. The phenomenological research approach was also chosen to reveal the meaning of the concept or phenomenon of experience based on the awareness of a community. Creswell (1998) stated that phenomenological research is essentially related to interpretations of reality that seek answers about the meaning of a phenomenon. The study was conducted in Lerep Village, Ungaran Barat District, Semarang Regency. The research environment in rural areas is dominated by the phenomenon of vast agricultural land. The subject of the research is farmers. Whereas the object of the research is local wisdom related to climate change. The focus of this research is the form and meaning of local wisdom that exists in the Lerep Village community and is related to climate change. Data sources of this research are informants, symptoms, phenomena, events, events, processes, behavior, activities, places, and documents.

The research informants were the village head, hamlet head, village apparatus, Lerep tourism village manager, and the community as general. The informants were chosen by using a purposive sampling technique. Informants who are members of the community were chosen from the community who know, understand, and are directly involved in the implementation of local wisdom in Lerep Village. All residents always participate or be involved in the implementation of local wisdom. Meanwhile, the key informant in this study was the village head. The reason for choosing this informant was because the village head has an important role and understands local wisdom activities. Lastly, the supportive informant of this research was the hamlet head, chosen to complete the research data.

The signs observed include various forms of local wisdom related to climate change. Meanwhile, events that were observed in the form of local wisdom were *tunggu gunung kudu wareg*, *kadeso*, and *iriban*. The three local wisdom is related to climate change which aims to maintain togetherness in protecting the environment, protecting water sources, and utilizing products from the agricultural land of Lerep Village. The behavior and activities of the people of Lerep Village were also observed to get an idea of how the community conducts and maintains the local culture. The data collection was obtained through observation, documentation, and interviews. On the other hand, the qualitative analysis was conducted through reduction, presentation of data, to making conclusions. Meanwhile, in descriptive analysis, the data obtained from in-depth interviews and observations were presented descriptively to support and strengthen the discussion.

III. RESULTS AND DISCUSSION

3.1 Lerep Community Local Advice: *Tunggu Gunung Kudu Wareg*

Tunggu gunung kudu wareg is a saying in the Lerep Village community which means efforts to preserve natural resources in the environment or the mountain as a place to stay (*tunggu gunung*). This local advice is a source of community food security to be able to live well (*kudu wareg*).

The advice *tunggu gunung kudu wareg* is conducted so that people can improve their standard of living to protect the environment. The contents of the advice are in the form of a ban tree logging, suggestions for planting plantation crops, and preserving a variety of local wisdom in its efforts to protect the environment. The suggestion can be carried out by getting the community to consume food from their land, carrying out existing traditions

to maintain a sustainable life, prohibiting neglecting traditions, and preserving the holy place.

Tunggu gunung kudu wareg as an effort to increase community income is carried out with an agroforestry system through plantation crops so that the community can access food. The meaning of local wisdom of the Lerep Village community in carrying out the advice is: avoid tree logging, preserving the surrounding area, and utilize natural products.

3.2 *Kadeso* or *Merti Desa* Local Wisdom

Kadeso or *Merti Desa* is an annual activity that has existed since 1973 and is carried out on Wednesday *Kliwon* after harvesting. The *kadeso* tradition is conducted as a form of gratitude to God for the harvest produced and the health given to the community. Moreover, *kadeso* is a form of gratitude for the people of Lerep Village which is demonstrated in a series of activities, such as conducting *istighotsah* or praying together, *tumpeng* festivals, marches, art performances, *gepuk bumbung* tradition, and shadow puppet performances all night long.

“acara kadeso sebagai wujud syukur yang diungkapkan dengan sedekah agar selalu diberikan kelancaran rejeki, panen yang bagus, kesejahteraan dan kemakmuran”.

Referring to the statement of Pak Sumaryadi (interview on July 15, 2020), the meaning of *kadeso* is charity towards the crops.

Kirab Kadeso carried out by traveling around the village with agricultural and plantation products including rice, corn, cassava, peanuts, fruits such as bananas, guava, snake fruit (*salak*), avocado, and various vegetables such as cabbage, chilies, eggplant, spinach, and others which are the products of the Lerep Village. All harvests are carried around the village by the village community while praying for prosperity.

After the *Kadeso* tradition carnival event was finished, the entire community distributed all agricultural and plantation products. This activity is a manifestation of the unification of the village government, village institutions, and the Lerep community so that a closer sense of kinship can be established. Also, the event is an effort to preserve the tradition of puppets so as not to be eroded by the rapid development of technology while also introducing arts to children and adolescents.

Kadeso activities must be carried out by the Lerep Village community. The consequence of not doing this is that the village head will become crazy. *Kadeso* is also an effort to save the village from crop failure caused by the descent of monkeys and wild animals from the mountains that will eat plants in the fields and forests. Therefore, with *kadeso*, the

monkeys will be *ruwat* with some offerings and water from the village spring so that the monkeys do not damage the plants.



Figure 1. *Kadeso* in 2019

Source: Lerep Village Government Documentation

Figure 1 showed that the realization of *kadeso* in Lerep Village was carried out through *tanggap wayang*. This is a form of gratitude for the health of the community and the blessing of the village which has abundant potential and yields. Charity activities mean giving gratitude for the crops harvested by the community.

In the *Kadeso* tradition, there is *gepuk bumbung* ritual, which is alms by putting coins into a bamboo box provided in front of each resident's house that has been loaded with *SPPT*. Then, there will be officers who take and put the money from the community into a large granary. After that, the lid will be opened, counted, and paid according to the tax amount at the peak of the earth alms celebration. *Gepuk bumbung* is a culture of saving to pay land and building taxes. This effort was made so that people obey taxes and do not feel objected to paying taxes.

3.3 *Iriban* Local Wisdom

Historically, in the past, there was a mission to spread Islam by Hasan Munadi, a representative of the Sultanate of Demak. Hasan Munadi made an irrigation channel which was flowed to Nyatnyono with the help of a white duck which made a water channel using stones shaped like a duck. *Iriban* comes from the words "*urub-urub*" or "*ngurip-urip*" which means to maintain and carry out existing traditions.

Iriban is a Lerep Village community tradition related to agriculture. *Iriban* is a tradition of the Lerep Village as a form of gratitude to God Almighty for giving abundant water and as a form of community service in cleaning up river flows.

The *Iriban* tradition is also known as the "*bancaan klubanan*". *Bancaan klubanan* consists of

nasi urap, grilled chicken, *gudangan (kluban)*, salted fish, tempeh that people bring to *Wangan Cenginging*. There, *nasi urap* will be served with organic chicken and chicken innards which are seasoned and roasted. The amount of organic chickens is 70 from the community. In the *Iriban* tradition, young coffee leaves are also served which are roasted in bamboo tubes and then mixed with *nasi urap*. The *iriban* rice must be consumed together in the place of *Wangan Cenginging* and must not be taken home and for example, there is leftover, it will be floated to the rice fields irrigation.



Figure 2. Community members working together to clean around springs and preparing *iriban*
Source: 2020 Research documentation

Figure 2 is an example of a series of *iriban* traditions that are held once a year in August. The *iriban* tradition is an effort to make the water flow easily, with no flooding during the rainy season, and the water can still flow during the dry season.

Iriban becomes a ritual that must be done every year because if not, there will be water shortages, landslides, floods, and dirty water because there is no river maintenance as a form of gratitude to Allah SWT. Specific foods that must be available when *iriban* are not vegetables that are usually cooked at home, but vegetables that are available in nature, such as papaya leaves, cassava leaves, *kudo* leaves, *keningkir* leaves (*cekracekri*). Vegetables in nature are served so that people understand that nature provides sufficient food sources to meet food needs.

Iriban is also local wisdom that continues to be carried out by the community. On the other hand, river cleaning is conducted in mutual cooperation.

3.4 The Meaning of Local Wisdom to Anticipate Climate Change

Climate change due to global warming is an unavoidable phenomenon. The phenomenon of

climate change has a wide impact on various aspects of life, including the agricultural sector (Surmaini et al., 2011). Changes in rainfall patterns increase the frequency of extreme climate events, air temperature, and sea level, which are serious impacts of climate change.

Humans have been involved in climate change conditions for hundreds of years. In communities with the lowest resilience, the effects of climate change directly impact human survival. The impact of destruction, rising temperatures, and rising sea levels will have a severe impact on anyone, especially poverty.

According to Herlina, Setyowati, and Juhadi (2019), local wisdom plays an important role in protecting the environment as in Pesisir Barat Regency, Lampung, which utilizes local wisdom to overcome environmental problems. Local wisdom is part of a wise society's way of dealing with environmental problems in Lerep Village.

Tabel 1. Makna Kearifan Lokal Desa Lerep

No	Activity	The meaning for the community	The meaning in anticipating climate change
1.	<i>Tunggu Gunung Kudu Wareg</i>	Mutual cooperation	Preserve the environment and reduce gas emissions
2.	<i>Kadeso</i>	A form of gratitude to God	Save the earth to be sustainable
3	<i>Iriban</i>	Working together to clean the river	Spring protection

Source: Research Data, obtained in 2020

Based on the table, *tunggu gunung kudu wareg* is carried out cooperatively by the community to preserve the environment and reduce gas emissions. *Tunggu gunung kudu wareg* as an effort to increase community income with agroforestry system through plantation crops so that people can access food. The meaning is not cutting trees, not destroying the surrounding area and utilizing natural product. Meanwhile, *kadeso* means conveying gratitude to the earth so that it is always sustainable. Thus, *kadeso* is a form of alms harvest to obtain prosperity.

Mungmachon (2012) established that local wisdom responds to local geographical-political, historical, and situational situations. Hence, local wisdom becomes knowledge for the community and has meaning.

The *iriban* local wisdom is a form of preserving the environment, especially in springs, by cleaning up every stream of springs. The community

carries out traditions by preparing events that are meaningful togetherness. In addition, cleaning up river flow is also done to maintain the stability of water flow, sustainable use of water flow, and not littering in the river.

In general, local wisdom in several places in rural communities has begun to be abandoned. Learning and stories from ancestors have also been abandoned because they have been eroded by technology and instant thinking, hence learning from natural events is no longer implemented (Rudi, 2016).

Parents should introduce various forms of environmental wisdom early on to children and young people. The inheritance of knowledge to maintain the natural environment that considers natural conservation and obeys natural laws to deal with climate change must be done early, individually, or in groups of people. Local wisdom is the order of life values inherited from one generation to another in the form of religion, culture, or customs commonly spoken in the social system of society (Agung, 2015). Related to protecting and preserving the environment for generations, examples of environmental wisdom must be practiced or demonstrated. It is because a parental learning experience is a knowledge that must be preserved and implemented as a learning material for many people.

IV. CONCLUSION

Implementing climate change anticipation cannot be done by one person alone. Lerep villagers conduct local wisdom as a form of environmental management to deal with climate change. Local wisdom activities in Lerep Village include *tunggu gunung kudu wareg*, which is local advice; village regulations for mutual assistance in preserving the environment; *kadeso* local wisdom as a form of gratitude for the harvest and to be able to live a prosperously; and *iriban* local wisdom as an effort to clean the flow of springs to avoid drought during the dry season and floods during the rainy season.

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