Water conservation based on local wisdom in Cikondang traditional village community

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Abstract. The purpose of this study was to analyze the role of local wisdom on water conservation in Cikondang traditional village community. This study use qualitative-descriptive analytical methods, data collection using observation, interview, and documentation techniques. Primary data is obtained from the results of in-depth interviews with informants selected purposively, while secondary data is obtained from local government documents and related institutions, as well as from articles that are in accordance with this study. The data is then analyzed through the stages of data reduction, data presentation, and drawing conclusions. The results of this study indicate that with the ritual of water that routinely carried out every year and followed by the traditional village community of Cikondang can provide knowledge of the importance of preserving water sources, communities with high awareness participate in maintaining the water source area. There is also the concept of prohibited forest, where with certain rules the community cannot freely enter the forest, this is one of the local wisdom that can protect the environment, especially the availability of water. The implication of this research is local wisdom needs to be conveyed to future generations because it is quite effective in water conservation efforts.

1. Introduction
Water is a material that makes life happen on earth. Humans and all other living things need water. As a water plant is absolutely necessary, if not or even no plants will grow abnormally even die. Water is also an important part of natural resources with unique characteristics, is dynamic and is a renewable and non-renewable resource under certain conditions [1].

Water is a source of life and a natural resource that sustains our environments and supports livelihoods – but it is also a source of risk and vulnerability [2]. The existence of water as the main source on earth has been threatened by the water crisis. The water crisis can be a threat to water shortages in the dry season, flooding in the rainy season and the occurrence of water pollution.

Around the world, there are now numerous signs that human water use exceeds sustainable levels [3]. Previous global water scarcity assessments, measuring water scarcity annually, have underestimated experienced water scarcity by failing to capture the seasonal fluctuations in water consumption and availability [4]. Water sources can be in the form of springs, groundwater, rivers, lakes, ponds, etc. so that the quality of land and water is absolutely necessary in efforts to conserve soil and water [5].

In some areas in Bandung Regency such as Dayeuhkolot, Baleendah, Majalaya when the rainy season arrives there are frequent flooding, rainwater does not seep into the ground but becomes a surface flow and then enters the river. The capacity of the river is limited so that the river is no longer able to hold rainwater so it overflows and eventually floods. Rivers have the ability to drain water both
directly from rainfall and coupled with seeping water and come out as a stream to the river [6]. Because land functions as land that is capable of absorbing rainwater, such as forests, plantation land, but due to human needs for land, forest and plantation lands experience changes from forests to agricultural land and settlements and agricultural land to other residential areas or uses. Changes in land use affect the ability of the land to infiltrate water, so that rainwater infiltration decreases then surface flow increases. Increasing water on the surface will eventually flow into the river. It shows that rivers that have a certain flow capacity will increase, so that the capacity of the river is not able to accommodate the flowrate. The incompatibility of capacity and flow rate causes the river flow to overflow and cause flooding.

Instead, the function of land from forests to fields and agricultural land into settlements or social facilities that are so fast cannot be denied their contribution to environmental damage, especially in the water crisis. We can observe changes in the quantity and quality of water during the rainy season and dry season. In the rainy season the water is abundant to cause flooding while in the dry season the drought. Based on this, conservation needs to be done to protect the water source while maintaining both quantity and quality.

Water conservation is an effort to use water that reaches the earth’s surface for human needs efficiently and meets various environmental needs [7]. Water conservation includes two parts, namely conservation of water resources (conservation of water resources) and conservation of water supply (water supply conservation). Conservation of water resources includes methods of storing and allocating water efficiently. Conservation of water supply includes distribution with minimal leakage (distribution with minimal loss) and consumption without any waste (consumption without wastage).

Water conservation is an effort to save water and use it for productive needs in the future [1]. This concept is called supply side conservation because the domain is at the source. The subsequent development of conservation is more directed at reducing or efficient use of water and is known as side-needs conservation. Good water conservation is a combination of these two concepts, namely storing water when excessive and using as little as possible (efficient and effective) for certain productive purposes. During the rainy season as much as possible to harvest rain water (rain harvesting) as much as possible and during the dry season use water as economically as possible.

According to Law no. 37 of 2014 concerning Soil and Water Conservation that Water Conservation [8] must be carried out based on state responsibility, participatory, integration, balance, fairness, benefit, local wisdom, and sustainability, and aims to realize as much as possible a just and sustainable people's welfare. Referring to the law, customs and habits found in local communities can play a role in water conservation. One of them is the customs and habits that are found in the traditional Cikondang village community in the form of rituals and other customs. For this reason, this paper aims to examine how the role of local wisdom in water conservation.

Local wisdom is a traditional view and knowledge that becomes a reference in behaving and has been practiced for generations to meet the needs and challenges in the life of a community. Local wisdom functions and is meaningful in the community both in the preservation of natural and human resources, in preserving adat and culture, and being beneficial for life [9]. In some local communities, they still assume that the environment around them has and inhabits other than humans, so there is the term 'sangeut keneh' (still haunted). Therefore, humans who dwell around them must respect and protect their places, such as forests, mountains, valleys, and water sources.

Sundanese people see that the natural environment is not something that must be subdued, but must be respected, nurtured, and cared for. In essence the attitude of the Sundanese people in relation to nature is more adaptive to nature [10]. This is evident in the case of farming which must carry out traditional belief traditions in the form of offerings, sacrifice of animals, or objects used to overcome life problems that are considered or trusted because of the existence of aspects of relations with nature [11]. It also appears in the culture of the Baduy community that conservation practices such as forests are considered sacred so that indigenous peoples respect their forest areas; The concept of Environmental Management with a zoning system, has also been known and practiced by the community. Baduy Region In analogous to the core zone on the concept of a national park; The Outer
Baduy Region is analogous to the intensive integration zone of Western concepts; The Dangka region is analogous to a buffer zone on the concept of a modern national park [12].

Another opinion states that local wisdom is a system in the order of social, political, cultural, economic, and environmental life that lives in the midst of local communities [13] and can also be interpreted as creative answers to geographical-political, historical, and situational nature that is local, can also mean life views and knowledge as well as various tangible life strategies of activities carried out by local communities in answering various problems in meeting their needs [14]. Some functions of local wisdom related to this theme are conservation and preservation of natural resources as well as advice, beliefs, literature and taboos [15]. Local wisdom has a Local Knowledge dimension, namely that every community has the ability to adapt to its environment because the community has local knowledge in mastering nature. As well as public knowledge about climate change and a number of other natural symptoms [16].

The sustainability of conservation efforts that lead to positive dynamics of the environment is one of the local practices that arise in local communities. Local wisdom is an important part of the pillars of environmental conservation [17]. The diversity of patterns of adaptation and the processes of interaction with the environment that exist in Indonesian society that have been inherited from generation to generation have been transformed as forms of rules and traditions as a guideline in utilizing natural resources. In other words, forms of behavior, responses and traditions that have become forms of human culture can be used to foster public awareness regarding environmental management and conservation in the future.

2. Methods
This research method uses qualitative-descriptive analytics to analyze how the role of local wisdom in water conservation in the indigenous village community of Cikondang. The study was conducted on the Cikondang Traditional Village Community located in Lamajang Village, Pangalengan District, Bandung Regency, West Java Province. Data collection was carried out between April-May 2019. Resource persons or informants were selected by purposive and snowball, namely resource persons who knew the research problems well. Data collected comes from primary data and secondary data. Secondary data in the form of articles related to research and documents from various agencies. Primary data is obtained from the results of observations and in-depth interviews with speakers who have knowledge of the problem under study. After the data is collected, then the data is analyzed and linked between data from the resource person (community leaders/key persons in the village of Cikondang), the local government, and documents from the relevant agencies [18].

3. Results and Discussion
In order to maintain balance with the environment, the Cikondang Indigenous Village Community implements norms, values or rules that have been passed down for generations as local wisdom that is routinely implemented. The following are local wisdom practices:
3.1. Spatial Cikondang Village
The Cikondang Traditional Village area has an area of approximately 3 hectares (Figure 1), consist of traditional house (house, ancestral tomb, bale, yard, leuit, meeting bale, lisung, and shower), Forest ban, and Paddy fields.

Based on Figure 1, the layout of cikondang traditional villages successively from south to north starting from the prohibited forest, the site of traditional houses, rice fields, and residential areas. The location of the forest in the south shows that there is protection against the presence of the forest from population disturbance, as well as certain rules when it comes to entering the prohibited forest. The rules include not being allowed to enter the forest on Tuesday, Friday, and Saturday; no footing; no cutting down of trees; must not disturb anything in the forest. This is in accordance with panjang teu menang dipotong pondok teu menang disambung (anything that is in the prohibited forest may not be changed). With these rules the forest in Cikondang village, which has many trees, has hundreds of years of age and functions as a regulator of the water system, remains sustainable. Forest protection and preservation is one of the techniques in environmental conservation, especially water.

The environment around traditional houses is still natural. Equipment or materials in managing the environment around traditional houses from natural materials. The traditional house yard is in the form of land, the yard should not be walled. Paths should also not be walled or cemented. The path is closed with rounded stones or small parts. This aims to make the rain water soak into the ground quickly so that there are no pile cileuncang around the traditional house.

3.2. Water Rituals
Water ritual is a ritual that is grateful for the abundance of water, both clean water and water for irrigation that meets the water needs of the entire Cikondang community. This ritual is routinely held every year in September or October on Monday or Thursday. The ritual activities include providing offerings, cone made by residents, cutting goats cooked at the ritual location, and cutting sheep. This ritual was attended by Cikondang residents ranging from parents to school children, local area officials, and officials from the service.

The purpose of this ritual is as a tasayakur bi ni’mah for the abundance of water from Allah SWT, as a learning process for the whole community regarding the existence of water sources and their preservation, the importance of protecting the forest by not cutting down trees that are water catchment areas, establishing hospitality with all water users, an explanation of the origin of the management of water sources, the use of springs, the importance of maintaining spring ecosystems.
After the water ritual, all levels of society are expected to have respect, ownership and responsibility in maintaining the preservation of water sources.

Discharge of water that comes out of the spring is about 25 lt/s and steady. Water is collected in reservoirs and then channeled through iron pipes and paralon pipes to residents' homes. The water is utilized to meet the domestic needs and irrigation of the lading rice fields of all citizens of Cikondang and other areas. With the existence of this clean water, residents are not allowed to make wells, even wells that were previously made must be closed.

3.3. Local Wisdom Values Of Cikondang
The values or norms that can be gleaned from the local wisdom of the traditional Cikondang village community are as follows:

- **Benefits:** in the form of shared values between community members in performing rituals, obedience to traditional leaders (Juru Kunci), consensus, mutual cooperation, justice in sharing water without conflict, and concern for the environment, especially the area around water sources as a recharge area.

- **Ethics and morals:** behave wisely towards the environment, be polite to the existence of anything contained in prohibited forests or springs, are morally responsible for the existence and preservation of springs, not destructive, and the most important is the attitude of thanking Allah SWT has given the gift of an abundant source of water.

- **Norms:** in the form of recommendations (carrying out rituals of water, cutting livestock that must be cooked around the place of ritual, respecting water sources), prohibitions (roads may not be concreted, prohibited from entering the prohibited forest on certain days, should not be on foot when entering the prohibited forest, do not make wells, do not cut trees carelessly), sanctions (get unhappiness, get an accident, get invalidity, life is not always easy), and expressions (panjang teu meunang dipotong, pondok teu meunang disambung = anything that is in the prohibited forest may not be changed, kudu ngadek sacekna, nilas saplasna = if you do not overdo it, as needed, ulah jati kasilih ku junti, ulah kageleng ku roda alam = not because of changing times resulting in lost customs).

4. Conclusion
Local wisdom is a traditional view and knowledge that becomes a reference in behaving and has been practiced for generations to meet the needs and challenges of a community’s life as well as functioning and meaningful as preservation of natural resources and retention of customs and culture, and becoming an important part of pillars - pillar of environmental conservation. With the ritual of water being carried out every year and the establishment of the concept of prohibited forests can increase the role of the community in the conservation of water resources. The values of local wisdom that can be obtained from the forest rituals and concepts are in the form of mutual cooperation, togetherness, justice, responsibility, obedience, and concern for the environment, especially water resources in order to remain sustainable.

Gratitude offered to God (Allah SWT) through the ritual of clean water and water rituals that flow through one village should continue to be carried out as an effort to preserve water resources, besides that the younger generation does not lose their identity and cultural customs in relation to conservation of water resources because they are successor of a cultural community. The management of clean water and irrigation organizations should be further enhanced by the way the local government gives stimulus to the managers of the organization and provides socialization to all water user communities about the importance of participation in organizing management both directly and indirectly. According to the author's observation with the abundance of water, beautiful natural scenery, terraced rice fields when managed professionally, the organization of irrigation water management can develop like Subak in Bali.
References

[1] Kodoatie and Sjarief 2010 Tata Ruang Air (Yogyakarta: Penerbit Andi)

[2] William A J, Henry J, and Vaux Jr 2007 The Emerging Global Water Crisis: Managing Scarcity and Conflict Between Water Users (Advances in Agronomy vol 95) p 1-76 doi.org/10.1016/S0065-2113(07)95001-4

[3] Postel S L 2000 Entering An Area of Water Scarcity: The Challenges Ahead (ESA Journal vol 10) issue 4 p 941-948 doi.org/10.1890/1051-0761(2000)010[0941:EAEOWS]2.0.CO;2

[4] Mekonnen M M and Hoekstra A Y 2016 Four billion people facing severe water scarcity (Science Advances vol 2) no 2 e1500323 DOI: 10.1126/sciadv.1500323

[5] Maridi 2015 Mengangkat Budaya dan Kearifan Lokal dalam Sistem Konservasi Tanah dan Air (Seminar Nasional XII Pendidikan Biologi) (FKIP UNS)

[6] Sugandi D 2007 Model Penanggulangan Banjir (Jurnal Geografi Gea vol 7) no 1

[7] Arsyad S 2008 Penyelamatan Tanah, Air, dan Lingkungan (Jakarta: Yayasan Obor Indonesia)

[8] Indonesian Ministry of Environment and Forestry 2014 Law No 37 of the Republic Indonesia No 37 of 2014 concerning Soil and Water Conservation

[9] Permana et al 2011 Kearifan Lokal Tentang Mitigasi Bencana Pada Masyarakat Baduy (Makara, Social Humaniora vol 15) no 1 p 67-76

[10] Indrawardana I 2012 Kearifan Lokal Adat Masyarakat Sunda Dalam Hubungan dengan Lingkungan Alam (Komunitas vol 4) no 1 p 1-8

[11] Suyaatmana E dkk 1993 Paririmbon Sunda (Jawa Barat) (Bandung: Departemen Pendidikan dan Kebudayaan, Direktorat Sejarah dan Nilai Tradisional, Proyek Penelitian dan Pengkajian Kebudayaan Nusantara)

[12] Suparmini et al 2012 Pelestarian Lingkungan Masyarakat Baduy Berbasis Kearifan Lokal (Yogyakarta: Fakultas Ilmu Sosial Universitas Negeri Yogyakarta)

[13] Thamrin H 2013 Kearifan Lokal dalam Pelestarian Lingkungan (The Local Wisdom in Environmental Sustainable (Kutubkhanah vol 16) no 1 January-June

[14] Permana C E 2010 Kearifan Lokal Masyarakat Baduy Dalam Mengatasi Bencana (Jakarta: Wedatama Widia Sastra)

[15] Sartini 2004 Mengali Kearifan Lokal Nusantara: Sebuah Kajian Filsafat (Jurnal Filsafat vol 37) p 111-120

[16] Mitchell B dkk 2003 Pengelolaan Sumberdaya dan Lingkungan (Yogyakarta: Gadjah Mada University Press)

[17] Marfai M A 2012 Pengantar Etika Lingkungan dan Kearifan Lokal (Yogyakarta: Gadjah Mada University Press)

[18] Sugiyono 2011 Metode Penelitian Kombinasi (Bandung: Alfabeta)