

The Contribution of Socio-economic Institution of Citarum Community to The spring conservation effort

R Ruyani¹ and A Herlambang²

^{1,2}Universitas Pasundan, Indonesia

¹Ruyani84@yahoo.co.id

Abstract. This research aims at discovering the current condition of the spring, knowing the contribution of socio-economic institution of local communities in the conservation of springs, and exploring alternative solutions. The research method used was qualitative-verification through phenomenological approach that was intended to discover and reveal meanings beyond the facts. The findings show that spring condition of Citarum upstream was not affected by the season, socio-economic institution contributed to springs conservation by conducting three specific zones around Situ Cisanti (green zone, cultivation zone, and interaction zones), and the well-behaviour implementation to environment (though no formal procedure is established yet). The role of socio-economic institution, in this sense, is inseparable from religious system of Sundanese who hold the inherited phrase, namely "*leuweung ruksak, cai beak, manusa balangsak*". This means that forests and springs must be maintained; otherwise, humans will obtain bad consequences. Furthermore, there is a folklore maintained by the local community, to protect the nature, saying that for those who damage the environment of Situ Cisanti and Gunung Wayang will obtain bad life. Ecological wisdom in utilizing nature is absolutely necessary for sustainable water resources. The findings are expected to provide insights for stakeholders, especially ABCGM ~ (Academic, Business, Community, Government, and Media).

1. Introduction

Humans are very dependent on environment and ecosystem. In general, ecosystem provides four main aspects in humans' life, namely providing humans' needs, regulating, supporting, and servicing cultural interests [1]. Therefore, humans have influence on and are influenced by ecosystem. Culture is a blueprint and an important aspect for humans in interacting reciprocally with the environment to create sustainable life. Local knowledge in managing the environment has decreased gradually. In fact, ecological wisdoms have not been transferred on to younger generations. The media for values internalization that lives in society is renowned as socio-economic institution.

The dynamics of socio-economic institution greatly affect the prevailing local wisdom. Local wisdom is an adaptation strategy that emerges from the community to respond to socio-economic problems related to people's lives. This local wisdom is initiated by the interaction between the community and its environment. The definition of socio-economic institution is not much different from what is called by social institution, organization, or community institution. The term refers to element of governing people's behaviour [2], define social institutions as the set of norms of all levels that revolve around a basic need in people's lives. Moreover [3], states that social institution is a tradition in human life that is formed by combining humanitarian reactions to the challenges and dynamics of the environment. It is then supported by the basic value of life [4], explains that socio-economic institution is a system of behaviour and relationship that focuses on activities to meet the complex needs in people's lives.

Based on the respective definitions, it is clearly stated that three main things in a socio-economic institution, namely human (as subject), activity carried out to meet the needs, and institution

(as object and norm that govern the activity). Therefore, socio-economic institution is now considered as a reflection of a set of rules that are guided by culture regulating the community's needs.

1.1. Local wisdom

Local wisdom is a collection of knowledge and ways of thinking that are rooted in the culture of a human group which is the result of observations over a long period of time [5]. In general, local wisdom is manifested in its own way that is unique in certain cultural norms, rituals, and traditions [6], states that the forms of local wisdom in the community are regarded with values, norms, beliefs, and special rules. Local wisdom functions for conservation, human resource development, cultural and scientific development, belief, literature and abstinence. Meanwhile, in maintaining local wisdom to sustain in current era, it is necessary to consider the upcoming challenges. The challenges for local wisdom, according to [7], are population growth, modern technology and culture, large capital, poverty and inequality, and the difficulty of society in fulfilling basic needs which causes social problems in the exploitation of natural resources.

The Law Number 32 of 2009 concerning Environmental Protection and Management defines local wisdom as local knowledge, intelligence, and policy. In more precise concept, local wisdom can be conceptualized as the noble values that apply in the life system of society used to protect and manage the environment in a sustainable manner. Therefore, spring conservation is closely related to the concept as the people believe that it is an ultimate gift from God to humans' life. Water and local wisdom are valuable assets that need to be preserved. Moreover, there is a tendency for the decreasing availability of water, but the need of water is increasing.

1.2. Environmental ethics

Human perspective in exploiting nature will determine the treatment of nature [8], believes that environment has mutual influence for human in which humans ecologically are part of environment. The sustainability of humans' lives are dependent on their needs. It means that humans is strongly influenced by environmental components as a place of life, it requires harmony between humans and environment.

These environmental problems are usually initiated by extreme practices of exploiting natural resources, without considering the capacity of resources. To pursue prosperity, natural resources are seen as factors of production to realize economic development goals without pay attention to its negative impacts. In implementing economic development [9], states that there are nine principles of environmental ethics to use, namely respect for nature, responsible to nature, cosmic solidarity, care for nature, no harm, living in harmony with nature, justice, democracy, and moral integrity. The principles of environmental ethics will guide humans to understand the importance of nature for them. Humans also need to respect the nature by maintaining their environment, including water resources. The availability of water resources is increasingly limited, as some places are categorized in critical condition. This is caused by various factors such as pollution, deforestation, and agricultural activities that put aside environmental sustainability and changes in the function of the catchment area.

2. Methods

This research used a qualitative-verification method by using phenomenological approach to discover meaning beyond the facts [10]. The data were collected by using triangulation techniques from five informants with different backgrounds. This research was conducted in natural setting. Therefore, qualitative research is also called as naturalistic research [11]. Natural object refers to an object that develops as it is, not manipulated by researchers, and the presence of researcher does not really affect the dynamics of the object. In fact, researcher is involved in the community (research subject) to obtain the data [12].

3. General Description of Research Site

Situ Cisanti is located in the up-stream of Citarum (the slope of Gunung Wayang). Formally, it is in Tarumajaya, Kertasari, Bandung, and West Java Province. The average daily temperature ranges from 12^oC - 25^oC with the dominant plants are tea, quinine, coffee, horticulture, pine, patchouli and eucalyptus. The livelihoods of the population are mostly in the agricultural field. The residents are mostly rural farming communities who are living in the area of Situ Cisanti as they are really dependent on it for daily water consumption.

The majority of local residents are *Urang Sunda* (Sundanese people) and they use Sundanese (Sundanese language) in daily conversation.. Sundanese people, according to [13], belong to the Late Malay group with Mongoloid and Malay-minded traits, who see themselves and others as important one, and God as the sole ruler and later all creatures will be back to Him. In Sundanese, the concept is stated by phrase “*mulih ka jati, mulang ka asal*”. The Sundanese people always put their focus on water as a source of life, in their consciousness, therefore spring (in Sundanese, it is called as *cinyusu* or *hulu cai*) conservation has been familiar for them. Outpouring of water from *cinyusu* is usually accommodated in a lake (or *situ*) which can then be used to meet the needs of drinking water, households, fish ponds, and irrigation for the surrounding rice fields.

Situ Cisanti, covering an area of 10 hectares on the slope of *Gunung Wayang*, holds water from seven springs, namely *Pangsiraman, Cikolebere, Cikawantang, Cikahuripan, Cisadana, Cihaniwung,* and *Cisanti*. The water flows through the Citarum for 269 kilometers, starting from upstream in Tarumajaya, Kertasari, the slope of *Gunung Wayang* to *Pantai Muara Merdeka*, Muara Gembong, Bekasi [14]. Based on recent facts, river pollution from Cisanti to Muara Gembong has been continue occuring for decades without any solutions [14]. Actually, the quality of water from seven springs is excellent. However, the pollution destroys its quality supported by four problems; (1) only about 700 meters out of Cisanti, Citarum has been used as a place to dispose of cow manure [14], (2) Citarum becomes the conversion of land into seasonal crops, such as vegetables, (3) after 20 km, precisely in Majalaya, there are textile industry centres that have industrial waste (solid colour, strong odour, and high temperature and acidity), and (4) after 60 km, precisely in Dayeuhkolot until Soreang, the industrial waste is added by domestic waste from dense settlements and shipping waste from Bandung. All these problems contribute to the severe pollution along Citarum.

Citarum plays an important role in providing a source of drinking water for 25.000.000 residents of West Java and DKI Jakarta. It also supplies electricity for Java and Bali (half of the Indonesian population). As the largest and longest river in West Java, before flowing into the Java Sea, it is used for Hydroelectric Power Centre (PLTA, *Pembangkit Listrik Tenaga Air*) in Saguling Reservoir (capacity of 700-1.400 MW), Cirata Reservoir (1.008 MW), and Jatiluhur Reservoir (187 MW). In addition, Citarumis also used by the centre of freshwater aquaculture through floating nets in Saguling, Cirata, and Jatiluhur. Citarum is a water source for 420.000 hectares of agricultural land in Bandung Regency, Bandung City, West Bandung Regency, Cianjur Regency, Purwakarta Regency, Karawang Regency, Subang Regency, and Indramayu Regency. Ironically, Citarum now is dealing with chronic pollution and flooding.

4. Results and discussion

Forests at Gunung Wayang are categorized as protected forests, production forests, and limited production forests as stated in the Minister of Forestry Decree Number 195 of 2003 concerning the Appointment of Forest Areas in the West Java Province. The dependence of the community around the forest area is very high towards nature [15]. Looking at the conditions along the current Citarum, it can be seen that environmental ethics has not been fully realized by the people who live along the Citarum.

Urang Sunda, in the past, were very aware of spatial planning for daily life, as stated in *Sang hyang Siksakandang Karesian* [16]. There are some suggestions in exploiting natural resources wisely. In the literature, there are 19 categories of land that must be avoided called "*kotoran bumi* (earth droppings)". The categories consist of *sarongge* land (haunted place), *lemah sahar* (anger land), *sema*

(grave), *catang ronggeng* (steep slope land), *garenggengan* (the soil surface is dry, but below is muddy), *dangdang wariyan* (sunken land which is often inundated), *lemah aki* (steep barren land), *kebakan badak* (pools including large ponds), *hunyur* (small hills), *pitunahan celeng* (piglets place), *kalomberan* (drainage ditch), and *jarian* (garbage dumps).

The spatial management still exist in society, even though it is getting faded. People implement their local spatial management based on five zones, arable land for farming, prohibited land in the form of forest land with sacred *karomah* (ancient) graves, reserved land in the form of reserve land for immigrants, covered land in the form of forest land for ecological interests, and reserved land for agricultural land expansion. As in Kampung Naga Tasikmalaya, the area is traditionally divided into three zones, namely the sacred area (where sacred forests are conserved by custom), clean area or residential area, and dirty area (bathing place, washing place, garden ponds, and livestock pens) [17]. The *Kasepuhan Cibedug* community, Sukabumi, has seven zones of land, namely *leuweung titipan* (safekeeping jungle), *leuweung kolot* (old jungle), *leuweung cadangan* (reserved jungle), *komplek karamat* (sacred site), *walungan* (river), springs, and others [18]. The community around *Situ Cisanti* generally still obeys in zoning distribution around *Situ Cisanti*, namely green zone, cultivation zone, and interaction zone. The community is still keeping the Sundanese phrase "*leuweung ruksak, cai beak, manusa balangsak*" (forest is damaged, water is depleted, human is miserable).

The damages of water resources lead to ecological disasters, such as floods, landslides, and droughts that often occur due to disruption of the hydrological system. Moreover, it is also caused by deforestation and proliferation of the function of gardens into commercial gardens, such as: vegetable gardens. The destruction of natural resources can weaken the farming and economic efforts of the rural community itself. Therefore, conservation of springs should be revived by implementing local ecological knowledge. Meanwhile, in maintaining local ecological wisdom, it is also necessary to consider the upcoming challenges. According to [19], the challenge of local wisdom is population growth, modern technology and culture, large capital, poverty and inequality, and difficulties in fulfilling basic needs.

The Citarum spring has close relationship with the history of Prabu Siliwangi (the king of Padjadjaran). As places of Prabu Siliwangi, Gunung Wayang and *Situ Cisanti* reflect their own beauty. The Dutch Colonial Government also promoted the natural beauty around South Bandung in its Tourism Promotion in 1912. In this place, apple and cotton grow well here and the hotels make the area around Pangalengan become famous [20]. It is written in the Travel Guide book in *Wewengkon* (area) Pangalengan about Nyi Anah's journey in the form of *Pupuh* (Sundanese ancient song) and folklore regarding *Cisanti* and Gunung Wayang. The people are familiar with the story of *Sasakala Cisanti* it is about Gagak Taruna who fell in love with Puteri Langka Ratna Ningrum (the daughter of Pangeran Jaga Lawang who lived at the summit of Gunung Wayang). However, he then also loved Nyi Kantri Manik, finally the marriage foundered and he died in the upstream of Citarum) This story has become an urban legend for the people in the South Bandung area. They believe in the story. In a full moon night, the faint sound of the gamelan (music instrument of Sundanese) can frequently be heard from the top of *Gunung Wayang*. It signifies that the *nayaga* (people who play gamelan) are still carrying out the procession of welcoming the marriage to the groom, Gagak Taruna. There is also smoke in Wayang Mountain billowing in layers, it means that the bride's family is cooking.

Cisanti will be maintained, when the surrounding area is also maintained. The existence of several activities and rituals carried out by Pilgrims at Pangsiraman Springs until now are preserved. The rituals are *wudhu diri* (self-ablution) meaning cleansing oneself from filth and sin, *Tawassulan* (getting closer to God by praying for the ancestors), *Ngabungbang* (self-ablution which is only done on the night of 12 *Robiul Awal*), *Ngumbah Pusaka* or washing sacred objects, *Nadran* (spreading flowers in Pangsiraman Springs and *Situ Cisanti* as a form of respect for nature).

There are some wise words in *Cisanti* area. The words are *tong ngomong sompral* (do not say arrogant), *tong ngotoran cai* (do not pollute the water), *tong nuar tangkal* (do not cut trees), *tong make syal warna beureum* (do not use a red scarf), and *tong ka jero leuweung mun teu jeung kuncen* (do not go into the forest without *kuncen* or guard officer).

In addition to some rituals and advices in *Situ Cisanti*, the surrounding community is also using the land according to the Sundanese proverb that has 12 types of intelligence thinking about the advice of spatial planning. It is to preserve the environment. There is close relationship between the message of *karuhun* (ancestors) and the conditions in *Situ Cisanti* environment. Of 12 *karuhun* messages, there are six preservation meanings that applied in *Situ Cisanti* area. First, *Gunung Kaian* means that the area must be planted with trees. *Gunung Wayang* therein must always be green meaning that it must be planted with trees because it is a water absorption region of *Situ Cisanti*. To anticipate this, the people use the elephant grass buffer so that the farmers will see the border of the land. Second, *Pasir Talunan* means that hills must also be planted. Third, *Situ Pulasaraeun* means that the lake must always be maintained. Fourth, *Legok Balongan* means that if there is a sunken place and near or above the spring, it is necessary to make a pond. Fifth, *Cinyusu Rumatan* means that the existence of the spring must have been guarded by the existence of the *Situ cisanti* folklore stated that the spring is guarded by a "watchman" named Nyi Kantri Manik. Sixth, *Lembur Uruseun* means that the village must be taken care of and arranged. The existing village must be arranged and made as a comfortable place.

The implicit meaning of all these messages is governance and spatial alignment with the surrounding environment. Based on the message of *karuhun*, the form of local wisdom in the *Situ Cisanti* Region has its own meaning in preserving the environment and the surrounding area. The form of local wisdom is very relevant to local advice, especially in relation to maintaining the sustainability of springs. The existence of a *pamali*, a sign made of stone as a boundary for something that is prohibited, is an effort to preserve the springs. The people also obey to the zoning division around *Situ Cisanti*, namely the green zone, cultivation zone, and interaction zone.

5. Conclusion

Situ Cisanti, as the water source, plays an important role. However, the findings show that the condition of the spring in upstream of Citarum – *Gunung Wayang* slope - is generally not affected by the season. It is rather influenced by the contribution of socio-economic institutions that support the conservation of springs.

The contribution is implemented in the use of zoning division; green zone, cultivation zone, and interaction zone. It is relevant to Sundanese phrase "*leuweung ruksak, cai beak, manusa balangsak*" (forest is damaged, water is depleted, human is miserable). Forests and springs must be maintained, otherwise, humans will feel the consequences. The contribution of socio-economic institutions was realized through folklore which was brought to life by the local community as a safeguard, including the figure of *Situ Cisanti* guard, Nyi Kantri Manik, and the figure of Gagak Taruna. If people try to damage the environment of *Situ Cisanti* and *Gunung Wayang*, you will regret it later. Then, the activities, rituals, and advices are still implemented by *Kuncen Cisanti* to the pilgrims who visit the *Pangsiraman* Spring.

Local ecological wisdom in exploiting natural resource is needed so that the wealth of water resources, especially for the existence of a spring, can be sustained. It is crucial for local community to deal with visitors; it is renowned by AGIL. It is a fact that the system of Sundanese relationship is changing as the consequence of religious education, formal education, market economy, morals and, government policies¹.

To be sustainable, it can be conducted through public announcement and enculturation. Government, through the Ministry of Environment, has launched a program called Spring Protection Program (PERMATA, *Program Perlindungan Mata Air*). It is a joint program in spring conservation. There is also a collaborative action between Ministry of Disadvantaged and Transmigration Villages (*Kemendesa PDPT, Kementrian Desa Tertinggal dan Transmigrasi*), Ministry of Tourism (*Kemenpar, Kementrian Pariwisata*), and Ministry of Cooperatives and Small

and Medium Enterprises (*Kemenkop UKM, Kementrian Koperasi dan Usaha Kecil Menengah*). Springs conservation along the Citarum is necessary, therefore, it requires full involvement of stakeholders who meet the pentahelix model, namely the government as a regulator, academics as designers, media as catalysts, and business practitioner as locomotive transformation (in terms of tourism), and communities as accelerators.

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