

CONSERVATION OF UPPER CIWALEN RIVER IN THE CITANDUY WATERSHED TO SUPPORT FOOD SECURITY FOR THE COMMUNITY DURING THE COVID-19 PANDEMIC

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Introduction

The river is one of the natural resources that support the life functions of all living things. The existence of rivers seems to go hand in hand with human development and culture. Historical records are evidence of the relationship between humans, rivers and culture. As population growth continues to increase, the river has become disturbed. Humans have intentionally or not disturbed the function of rivers as life support (Zunariyah, 2018). Based on data from the Ministry of Environment and Forestry on March 22, 2019, 75% of river water from 52 rivers in Indonesia has been heavily polluted. 20 river basins are moderately to heavily polluted, 118 watersheds out of a total of 450 watersheds in Indonesia are in critical condition. The island of Java is even reportedly threatened with a scarcity of clean water (Sutiawan, 2019).

One of the watersheds in Indonesia is the Citanduy watershed in West Java. The Citanduy watershed has an area of 92,445 hectares and is included in the administrative area of Tasikmalaya Regency, Tasikmalaya City, Ciamis, Garut, Kuningan, Majalengka, Banjar City, Cilacap, Banyumas, and Pangandaran Regency (Ministry of PUPR, 2019). One of the rivers upstream from the Citanduy watershed, namely the Ciwalen River, is administratively located in Nanggewer Village, Pagerageung District or in the northern part of Tasikmalaya Regency, precisely in the area of Mount Cakrabuana. The upstream Ciwalen river is currently experiencing damage. People who do not hesitate to throw garbage into the river make the river polluted. This community behavior is inseparable from the poor understanding of the community about the importance of preserving rivers. This is an irony, because in fact most of the people of Nanggewer Village use the Ciwalen River for irrigation to meet the water needs of agricultural land. In addition, river water is also used for domestic needs such as toilets.

Conservation of natural resources and the environment is not the responsibility of a few people but all human beings on earth because conservation as part of development activities does not limit differences in administrative and governmental areas. Conservation of natural resources is the activity of managing and utilizing natural resources wisely while ensuring their availability in a sustainable manner as well as maintaining and making efforts to increase the quality of diversity and its value. Resource management as the main supporter of national development needs to pay attention to the sustainability of its management so that the interests of current and future generations can be fulfilled.

Problems in managing natural resources and protecting the environment have become increasingly complex during the Covid-19 pandemic and the impact of global climate change has followed. All people on earth have felt the impact which is expected to increase if the government, related parties and society anticipate it through adaptation, mitigation and conservation efforts. This activity is an action taken to maintain the existence of natural resources in a sustainable manner both in quality and quantity, so that it can contribute to saving the use of natural resources and treat them based on natural law.

The root of the problem found based on the results of observations of the people around the Ciwalen River in the Citanduy River Basin is that the way people perceive and treat the river is not based on sufficient knowledge. Through this Community Service activity, the team tried to synergize the village government of Nanggewer, Pagerageung District, Tasikmalaya Regency - West Java Province and environmental activist Srikandi Sungai Indonesia to conserve the land of the Ciwalen river, the Citanduy watershed, in an effort to realize community food security, especially during the Covid-19 pandemic era.

The low level of education of the community is one of the obstacles to lack of knowledge regarding river use. Seeing this condition, the team outlined several solutions to solve problems faced by the community, among others: 1) To disseminate information to the community regarding river conservation; 2) Provide an understanding of river contribution in realizing community food security; 3) Planting around the banks of the Ciwalen River in the Citanduy River Basin with various types of productive plants such as vegetables, fruits and woods.

The implementation of this community partnership program activity is carried out in three stages. The first stage is the preparation stage. At this stage the proposing team conducted a field survey as a preliminary to see the real conditions of the community around the Ciwalen river in the Citanduy River Basin regarding the problems faced by partners. At this stage, observations, identification and interviews were carried out with the two partners, namely the Village Head and the chairman of the environmental organization Srikandi Sungai Indonesia, which is located in Nanggewer Village, Pagerageung District, Tasikmalaya Regency, West Java Province.

The second stage is the implementation phase of community partnership program activities. In this stage, the proposing team conducted outreach activities to the community of the two partners regarding the conservation of land on the banks of the Ciwalen River in the Citanduy River Basin to achieve community food security. In addition to the socialization, in the second stage, vegetable, fruit and timber crops were also planted on the land around the banks and upstream of the Ciwalen river and around residents' houses. The third stage is an evaluation carried out through monitoring the continuity of the productive plant planting program in order to support the realization of sustainable community food security.

Discussion

This community service activity has three achievement targets, namely: First, a change in the way the community views nature (in this case the Ciwalen river and Citanduy watershed) as parts that must be preserved in order to support the sustainability of community life. Second, increasing public understanding of the importance of preserving rivers, and third, Conservative Land Use around the Bantaran and Upper Ciwalen River, Citanduy Watershed to foster community food security, especially during the Covid-19 pandemic.

1. Changes in the Way People Perceive Nature

Humans have an important influence on the sustainability of the human habitat ecosystem itself. Actions taken or policies regarding relationships with the environment will affect the environment and humans themselves (Rusdiana, 2015). This community service has a target of changing the perspective of the people of Nanggewer Village, Pagerageung District, Tasikmalaya Regency, West Java Province, especially those who take advantage of the Ciwalen River to support their fulfillment of life from mechanistic to systemic organic.

Initially, humans viewed nature based on an organic paradigm. This paradigm shapes the character and behavior of humans who perceive the universe as part of human life in a harmonious pattern of relationships that tend to protect the universe. However, the organic view of nature is currently being replaced by a mechanistic paradigm. This paradigm views the universe as consisting only of matter which is basically a machine which is separate parts and humans are considered as the highest part because they have a mind and a soul.

This paradigm has a tremendous impact on various areas of life including the environment. Today's modern crises, including global environmental disasters, are thought to have their roots from this mechanistic point of view. This point of view creates apathy, destructive and exploitative attitudes towards the environment. This paradigm views nature as a giant machine that only has a mechanical function without any value to be preserved. This view assumes that nature is separate parts, so that with one part / element it will not affect other parts and the whole of nature.

The systemic organic view is also known as the ecological paradigm which focuses more on the patterns of relationships and interactions between the various parts and components of the universe and the living organisms in it without neglecting the importance of matter. Through this perspective, the universe is not approached with domination and control, but with an attitude of cooperation, respect and respect for the environment. Humans must build patterns of interaction and harmonious relationships with nature and not see nature as a machine that can be exploited at any time according to human needs without realizing the consequences for human life itself. Nature should be addressed and approached in its entirety, not only using reason, but with feelings, intuition and five-sense experience that view the universe as a tremendous gift from God. This perspective or paradigm will in itself determine policies and approaches in relation to the environment. Changes in the perspective of the people living around the banks of the Ciwalen River can be seen from the community's efforts to preserve the river by keeping the river clean and even beautifying it. The community also made efforts to clean the river by going directly into the river and cleaning the river from rubbish (Figure 1).



Figure 1. River Clean Action by the Community Around the Ciwalen River

2. Increase Public Understanding of the Importance of Preserving the River

Environmental awareness departs from an understanding of the natural environment as a system, and the position of humans, namely as responsible managers. This ethical foundation emphasizes the need for a harmonious relationship between humans and their environment, because ecological intelligence is supported by ecological conditions as well. Sustainable development is more following an eco-centrism view and not an anthropocentrism view in an environmental ethics perspective.

Keraf (2002) describes the principles of environmental ethics, which, if examined further, also play an important role in sustainable development efforts. The principles of environmental ethics are: (a) respect for nature; (b) the principle of responsibility (moral responsibility for nature); (c) cosmic solidarity; (d) the principle of love and concern for nature (caring for nature); (e) the principle of no harm; (f) the principle of living simply and in harmony with nature; (g) the principle of justice; (h) democratic principles; and (i) the principle of moral integrity.

The importance of rivers is one of the natural resources that can support the life functions of all living things. One of the important things is the availability of water that can attract all organisms to live not far from it. As for the function of rivers, as population growth continues to increase, the existence of rivers has become disturbed, humans have intentionally or not disturbed the function of rivers as life support. The socialization of river conservation is expected to be able to contribute to community understanding regarding the benefits of rivers and the importance of preserving rivers in relation to efforts to achieve family food security (Figure 2).



Figure 2. Socialization Activities on River Conservation to the Community

3. Conducting conservative land use around the banks and upstream of the Ciwalen River in the Citanduy watershed

Conservative land use is realized through community participation in river management which is aimed at realistically through conservation efforts by planting along the banks and upstream of the Ciwalen River in the Citanduy River Basin. This activity starts from the process of seeding and selecting plant seeds in accordance with the characteristics of the existing land in Nanggewer Village, then continues with planting hard trees on the banks and the Upper Ciwalen River to the maintenance and monitoring stages. The activities carried out can be described as follows:

a. Preparing Plant Seeds

Preparation of plant seeds starts with preparing plant seeds. Plant seedlings are procured by buying certified seeds and plant seeds from local communities. The types of plants prepared for this service activity consist of vegetables, fruits and woods. Meanwhile, the selection of planting media utilizes materials available in the community, namely soil, husks, and compost which function to hold and drain water properly so that it will have good aeration.

Productive plants will be distributed to the community to be planted in their home gardens as priority crops, namely vegetables, including: chilies (*Capsicum frutescens*), pakcoy (*Brassica rapa* subsp. *Chinesis*), tomatoes (*Solanum lycopersicum*), water pumpkin (*Lagenaria siceraria*), long beans (*Vigna cylindrica* (L). Timber planting will be carried out on land with slopes of 20-30°. Types of wood plants include: mahogany (*Swietenia mahagoni*), alba (*Alba pompeia*), mango (*Mangifera*), avocado (*Persea americana*), durian (*Durio zibehinus*), petai (*Parkia speciosa*), sago (*Meroxylon sago*), candlenut (*Aleurites molusccanus*), eucalyptus (*Eucalyptus* sp).

b. Cultivation in the Ciwalen River Basin

Critical land is one of the main problems of a number of existing problems, because it can trigger sedimentation which results in silting rivers, especially in the estuary. One of the factors in the occurrence of critical land is erosion caused by surface run-off due to lack of land cover (land cover) caused by land use by humans. On this basis, it is necessary to conserve the river area, especially on the banks of the Ciwalen River, which is part of the Citanduy River Basin which has good water quality so that it is used by the community for irrigation channels and domestic needs.

In relation to the importance of preserving the environment and the function of forests in preventing erosion, Nizar et al., (2019) argued that, "plant seed assistance helps improve environmental quality, such as making the air cooler, maintaining moisture, absorbing dust". Types of wood plants prepared for conservation activities include: mahogany (*Swietenia mahagoni*), alba (*Alba pompeia*), mango (*Mangifera*), avocado (*Persea americana*), durian (*Durio zibehinus*), petai (*Parkia speciosa*), sago (*Meroxylon sago*), candlenut (*Aleurites molusccanus*), eucalyptus (*Eucalyptus* sp).



Gambar 3.
Bibit Durian (*Durio Zibehinus*)



Gambar 4.
Bibit Kemiri (*Aleurites molusccanus*)



Gambar 5.
Bibit Alba (*Alba pompeia*)



Gambar 6.
Bibit Ekaliptus (*Eucalyptus* sp)

The planting activity on the banks of the Ciwalen River received support from various parties, such as: Head of the Nanggwer Village PKK activating team, the community and nature-loving volunteer groups. Planting activities are carried out with guidance from representatives of the Forestry Service who provide some information regarding how to transfer plant seedlings correctly.



Figure 7. Planting Activities on the banks of the Ciwalen River

c. Upstream of the Ciwalen River

According to Yekti et al., (2013) the Cintanduy watershed has a minimal forest area and the high development of embankments along the river which affects the characteristics of surface runoff, increases the volume of surface runoff. The silting process that occurs in the downstream part of the river cannot be separated from the influence that occurs in the upstream part of the river, or in other words, the watershed is an ecosystem that affects each other. One of the upstream rivers of the Citanduy watershed is on Mount Cakrabuana through the Ciwalen River which is administratively located in Nanggawer Village, Pagerageung District, Tasikmalaya Regency, West Java Province

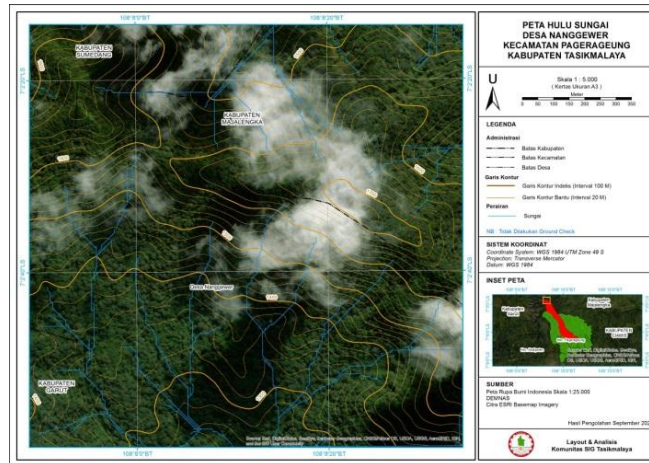


Figure 8. Map of the Upstream Ciwalen River - Citanduy Watershed

Vegetation as land cover and land use type will affect river flow, so that any land use change will have an impact on river flow. Rustiadi, et.al., (2009) stated that land use change in the implementation of development is an inevitable process. Land use change development factors can be caused by population growth, if changes in land use continue to occur, the function of a watershed will be disrupted and the hydrological system will be disrupted. Indicators of disturbance to watersheds are changes in hydrological behavior such as high frequency of flood events (peak flow) and increased erosion and sedimentation processes and decreased water quality (Mawardi, 2010).

In fact, the upstream part of the Ciwalen river in the Citanduy watershed is land with a steep slope so that it has a risk of being prone to landslides. Improper use of land by the community can trigger disasters. The land that should be planted with perennials is in fact used by the community for productive crops.

Planting in the upper reaches of the Ciwalen River was carried out by dividing the team into two groups, namely the group that prepared the planting area and prepared the seedlings. As is the case on the banks of the Ciwalen River, the upstream area is also planted with hard trees such as mahogany (*Swietenia mahagoni*), alba (*Alba pompeia*), and candlenut (*Aleurites moluccanus*). Referring to Sumedi's (2015) opinion, this type of plant is suitable for planting in slope areas because the roots play a role in gripping the soil so that it can reduce the possibility of soil movement.



Figure 9. Preparation of Cultivation Land in the Upstream of Ciwalen River

The activity was carried out for two days, consisting of land preparation and planting the following day. The location of the activity which is at an altitude with a location that is difficult to reach does not reduce the enthusiasm of the participants and partners and participants consisting of the community, community leaders, environmental activists, and school kids.



Figure 10. Cultivation Activities in the Upstream Ciwalen River Citanduy Watershed

Conclusion

Community service activities have a positive impact in supporting community food security. The most basic thing is to provide knowledge and insight to the community in managing the environment in a balanced manner by optimizing the potential of natural and human resources owned by the region. Through their knowledge and insight, the community is able to manage and utilize the local environment to meet their short and long term needs without neglecting the environmental aspects of the environment.

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