The Interrelationship of Sustainable Economic Value of Watersheds Using Contingent Valuation Method Approach with Circular Economy: A Literature Study

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Abstract. Waste accumulation mainly causes environmental damage. Watersheds experience high waste pollution problems. Therefore, the need to maintain ecological sustainability by maintaining the cleanliness of the watershed environment. This research studies the interrelationship of economic value in watersheds as measured by the contingent valuation method approach with the circular economy. This research aims to identify the application of circular economy and know the use of the contingent valuation method approach in measuring the economic value of natural resources in the form of watersheds. The method used is a descriptive approach using literature studies. This research uses secondary data by collecting data and information through website-based electronic media, relevant journals, previous research, and so on. The results of this research are measuring the economic value of watersheds using circular economy and using the contingent valuation method to find out how willing to pay from the community towards environmental improvement and the desire to receive compensation from ecological damage. The application of a circular economy is expected to reduce waste pollution and can increase economic growth.

1. Introduction

Nature provides resources, and humans as resource users are described in economics as nature as producers and consumers. Resources are divided into renewable natural resources, non-renewable natural resources, and environmental services. The linkage between nature and humans prompted economists to dig further into how much human preference for help is available in the heart. The absence of comparable market prices causes difficulty in determining economic value. Therefore, non-market valuation is determined, so that it can be calculated. Methods is used for non-market valuation by looking at the characteristics of public goods such as natural resources is then used the contingent valuation method.

The Contingent Valuation Method approach was first used by Robert Davis in his research in 1963 to calculate the value of hunting parks in Miami. This approach was only famous around the mid-1970s when the United States government adopted it to research [1]. Measurement of economic value in natural resources and the environment is done to determine the damage that occurs. Economic value is the maximum value of a person who sacrifices goods and services to obtain other goods and services. This concept is commonly called willingness to pay.
Watershed is one part of hydrology containing abiotic and biotic elements that interact and depend on each other. Therefore, one must pay attention to the role of ecosystem elements. As a place for interaction and interdependence between living things, the watershed should be integrated and comprehensive.

Nowadays, the river is a watershed environmental service that is still considered a common pool resource that does not have a market price. So, the value of ecological services is often overlooked because it is difficult to measure by numbers, even though the benefits provided are quite enormous for the community's welfare. The use of environmental will not obtain the value of environmental services if the condition of environmental services is in poor condition. Therefore, to improve the quality of environmental services in watersheds, rehabilitation and conservation of land need to be done. However, policymakers always have difficulty calculating the value of environmental damage in economic valuations, so research is required to find out the monetary value of environmental services. In addition, the problem faced in the watershed is waste in the form of garbage. The condition of waste in Indonesia has increased drastically. It can happen because the increase in population and habits of the community throwing garbage into the river makes the waste problem unfinished.

If the watershed is dirty and unkempt, then the community will bear the consequences, namely the flood disaster. Management of watersheds is necessary by involving the community and the competent government. There needs to apply the concept of circular economy in the watershed. The circular economy concept is intended to make the watershed area clean and free from water pollution caused by waste.

This research aims to identify the application of circular economy and find out the use of the contingent valuation method approach in measuring the economic value of natural resources in the form of watersheds in several regions in Indonesia based on previous research.

2. Method
The qualitative method is obtained in this research. Using literature study research by reading various books, journals, and other publications related to research topics, to produce a paper on the subject of linkage between circular economy and contingent valuation method to measure the economic value of environmental services in watersheds in several regions in Indonesia. Articles are taken from various journals that have been published in national journals indexed and indexed Scopus with the year of publication from 2010-2020. This research limitation only assesses the environmental preservation of watersheds for more general locations and aims to be implemented in watersheds in Indonesia.

3. Results and discussion
3.1. Contingent Valuation Method on Watersheds
Environmental degradation in watershed area is much related to human characteristics that manage and utilize the environment and relationships between human beings. Environmental damage leads to economic losses, decreased food security, environmental degradation, and loss of ecosystem services. It describes the externalities caused by changes in watershed closures that are widely felt by the community.

The researcher can conduct a case study in the United States in 1997 on watershed protection through innovative and cooperative efforts across various watershed stakeholders by creating a memorandum of approval (MOA). This MOA is an effort to convince multiple stakeholders. The MOA can do watershed management with a dual goal of economic development and sustainably maintaining water quality optimally. In the process, the developed strategies and practices that developed attempt to strike a balance between watershed protection with the development of community and state [2].

Payment of environmental services is intended to compensate land farmers in the upstream watershed. So that they can modify specific existing land use procedures for concerto so that data does not have an impact on improving water availability both in quantity and quality to water users downstream of the river [3]. One way to address watershed damage is to implement payment of
environmental services to rehabilitate forests and land [4]. The principle of compensation introduced by Kaldor and Hicks is that a change should be made if there is a potential profit so that all can be bettered off by redistributing goods or income as a result of the transformation [5]. Hicks suggests indirect welfare measurements are associated with utility gains and reductions using alternative measures, namely by the interpretation of Willingness to Pay (WTP). This research can approach WTP values with the contingent valuation method (CVM), which is a direct economic assessment method through the question of one's willingness to pay. CVM is a method that measures economic value for community who is not directly related to a policy change and can also be used to analyze ex-ante policies [6]. Roumasset and Wada (2013) also developed an assessment methodology to measure the value of upstream environmental services in order to obtain optimal value in groundwater conservation and watersheds. The ecological investment will reduce the shadow price of groundwater against groundwater itself, and watershed elevation should occur until the marginal cost of the investment equals marginal [7].

3.2. Application of Circular Economy on watershed

A circular economy is an alternative used to the traditional linear economy (make, use, discard) where economic actors keep resources usable for as long as possible by digging the maximum value in their use, then regenerated at the end of each product's life (Nika et al., 2020). In this system, wasted resources, waste, emissions, and energy are reduced by closing the production-consumption cycle by extending the product's life with innovations in the design of recyclable products. The circular economy model allows economic actors to minimize material consumption, waste proxies, and emissions while maintaining economic growth [8]. The concept of circular economy is applied in different ways to its application, according to a research conducted by Kirchherr (2017), stating the idea of circular economy to be a green economy concept applied to reduce carbon [9].

The application of a circular economy has been developed in several countries. Research by Winans et al. (2017) shows that the circular economy application in various countries has its own way [10]. The application of the circular economy in some countries is shown in Table 1.

| National Origin       | Circular Economy Anointing                                                      |
|-----------------------|----------------------------------------------------------------------------------|
| German                | Policy on environmental issues with sustainability of natural resources and feedstocks |
| Japan, Singapore, South Korea | Application of green city and consumer characteristic in responsibility for environmental sustainability. |
| China                 | Create an eco-industrial park by building technologies that drive product development and production management |
| North America and Europe | Cooperation in research and application of the 3R principle in everyday life.       |
| England, Denmark, Switzerland, and Portugal | Waste management |

Circular economy in the watershed is conducted by renewing the community to dispose of garbage in the trash. Trash cans are also distinguished into several types of waste, such as biodegradable waste and non-biodegradable waste. Biodegradable waste will later be reprocessed into compost, while non-biodegradable waste will be recycled into more valuable goods. Implementing a circular economy in watersheds is expected to prevent catastrophic flooding and excessive piles of garbage [11]. Waste management is not spared by the willingness to pay (WTP) for environmental improvements around the watershed. Such payments are made regularly, and fee collection is made by the relevant agencies [12].
4. Conclusion
Based on the discussion regarding the economic valuation of the watershed can be drawn several conclusions as follows. First, measuring the economic value of environmental services is needed by calculating the value of WTP to measure the community's willingness to repair watershed damage. Second, circular economy energy is expected to reduce the ecological degradation of watersheds. On the other hand, the application of a circular economy in watersheds can be done with the CVM approach to find out the nominal amount issued by the community to overcome environmental damage around the watershed.

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