Ecological Legal Aspects for Sustainable Riparian Landscape Management in Sempur Area, Bogor City, Indonesia

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ABSTRACT

Ecological landscape management for a riparian zone of Ciliwung River at Sempur and its surrounding is aimed to establish sustainability. Ciliwung River flows along 119 Km from the head water area in Telaga Warna, Puncak highland to the downstream in Jakarta Bay. Survey method include field observation with supporting by literature research to find the legal aspects in acts and regulations, including local and regional regulations, which are related to river riparian management. Sempur riparian area stretches from Lebak Kantin to Warung Jambu. It is a high-density populated area and has few people concerned with ecological issues. Most of them have built housing and settlements right at the river edge, without considering any border. Most of communities do not consider the river as a waterfront. Therefore, it may indirectly influence people's behavior on treating river as a garbage dump. There are some management approaches that could be conducted in the riparian, Ciliwung River, i.e. ecological, economic, socio-cultural and eco-political approaches. This paper is designed to emphasize legal aspects in eco-politics, as an effort to sustain a riparian area management program. Regulations and acts that have been established by both national and local governments do not fully consider all sides sustainable riparian area management. There are some regulations concerning environmental issues such as Policy on Environment, National Spatial Planning, and Environmental Management Act (UUPLH). They, however, only mention a little about environmental management issues. For the decision maker, this condition is not enough. Then should be addedsome specific points of Ciliwung riparian landscape management. Research findings show that there are a number of mechanisms and policy suggestions. There are for example: regulations on the river border or incentive system enactment to improve landscape quality such Adipura and Kalpataru Awards, competitions, tax reduction, etc., and disincentive system implementation aimed to prevent and overcome any deterioration and landscape values degradation as well as environmental pollution such as pollution charges, fines, and detention. In conclusion this paper considers the legal aspects of riparian landscape management.

Keywords: Ciliwung River, Ecological landscape management, Legal aspects, Riparian landscape.

1. INTRODUCTION

Riparian zones are the areas that border intermittent or permanent streams and rivers. They are the transition between the terrestrial environment and the aquatic environment. The vegetation growing in riparian areas can vary from mature forest to grasses. Well vegetated riparian zones are important for many reasons. Often, the most productive soils are found along major waterways. Vegetation in the riparian zone acts as a retaining wall in reducing soil and nutrient loss by slowing surface runoff before it reaches the stream (Figure 1). When runoff is slowed, erosion is reduced and the quality of the water is maintained. One of the major sources of the sedimentation and nutrient pollution of streams and rivers is from non-point areas, such as agricultural fields, pastures, and roadways. As well vegetated riparian zone can act as a buffer and reduce this form of pollution. Riparian areas are often subject to flooding. Trees and shrubs growing along the banks help moderate floods by slowing the flow of the water. Less damage is done downstream when vegetation absorbs some of the water's energy. Therefore, good management of riparian zones enhances water quality, reduces flood damage downstream, help wildlife, and provide valuable natural resources and community live on it. Such management that gives best benefit for the environment and human life is anything relating to sustainability.

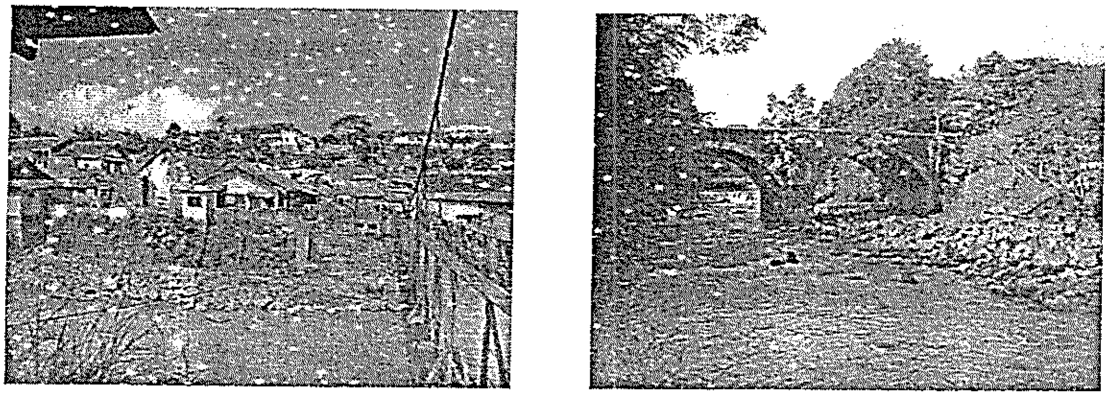

Figure 1. Concrete wall (left) in Northern Sempur area and well vegetated riparian zones (right) in the segment between Bogor Botanical Garden and Lebak Kantin, Sempur area.

Sustainability has become the primary goal of both economic development and natural resources. Planning and managing for sustainability require that we focus more intently upon the long-term consequences (World Commission on Environment and Development 1987). Sustainable development is development which integrates economic, environmental, and social values during planning; distributes benefits equitably across socioeconomic strata and gender upon implementation; and ensures that opportunities for continuing development remain undiminished to future generation.

Natural and human activities on the landscape have the potential influence water quality and aquatic ecological integrity (Hunsacker et al. 1993). Humans currently manage or otherwise have changed most of the landscape of the riparian area. Additionally, areas close to streams and other watercourses can dominate important factors that influence aquatic ecosystem integrity, such as vegetation along streams and erosion from stream banks (Steedman 1988). Intact riparian zones provide numerous critical ecological functions (Gregory *et al.* 1991). They stabilize stream banks and prevent bank erosion while providing inputs of organic matter that constitute the base of stream food chains.

Ecological landscape management for riparian of Ciliwung-River at Sempur and its surrounding is aimed to establish a sustainable riparian zone. Ciliwung River flows along 119 Km from the head water area in Telaga Warna, Puncak highland to the downstream in Jakarta Bay. Research on legal aspect relating to an effort to establish sustanaible riparian zone is one of important things to do. Eco-politic aspect in this ecological management for riparian of Ciliwung river could be conducted in applying policy on environmental management and environmental control cited in local regulation. As a public goods, riparian Ciliwung river could be established through management concession by community (quasi property right) to improve economic externality and to decrease impact towards environment and to increase cultural vibrancy in community.

2. MATERIALS AND METHODS

Sempur riparian area is located in Sub-District of Central Bogor. This area is passed by Ciliwung river, which flows along 119 Km from the head water area in Telaga Warna, Puncak Highland to the downstream in Jakarta Bay. Survey method was held for field observation while supported by literature study to find the legal aspects out in act and regulations, included local and regional regulation, which is related to river riparian management. Sempur riparian area is stretching from Lebak Kantin to Warung Jambu (Figure 2). It is a high-density populated area and less concerned people in ecological issues.

Figure 2. Sempur riparian area and its surrounding.

3. RESULTS

The high density of population in Sempur area is a serious problem that gives impact to ecosystem and ecology in riparian Ciliwung River. People behavior that mostly consider river as a water-back (it's not water-front), has treat river as a giant garbage dump (Figure 3). Building of housing and settlement right at the river edge without considering any border river takes part in contributing serious problem in riparian environment as well. Sempur area located in riparian Ciliwung River is most seriously affected by flood and land slide. Almost once in five years there is serious flood in Ciliwung river that put community and environment surrounding in danger.

Figure 2. Settlement condition in Sempur riparian landscape. The housing are connected directly to river body.

Actually there is rule that prohibit people to construct housing and settlement in the river edge. But most people break the rule and disobey it. There are so many factors influencing this behavior, e.g. there is no information, no law enforcement, and un-controlling towards permit for building construction and land using. It seems that land use development happen just the way it is without any proper controlling and directing. If it is continues ecosystem and ecology existence as well as human life would be threaten because of environment deterioration and carrying capacity problem.

Ecological landscape management for riparian of Ciliwung River at Sempur and its surrounding is aimed to establish a sustainable riparian zone. There are four major approaches in this management i.e. ecological, economic, socio-cultural and eco-political approaches. In this paper, we emphasize in eco-politics approaches. Eco-politic aspect in this ecological management for riparian of Ciliwung river could be conducted in applying policy on environmental management and environmental controlling cited in local regulation. As a public goods, riparian Ciliwung river could be established through management concession by community (quasi property right) to improve economic externality and to decrease impact towards environment and to increase cultural vibrancy in community.

4. DISCUSSIONS

Basically regulation and policy on landscape management implicitly has been included in regulations and policy on environmental management. Riparian zone management needs support from varies stakeholders, in order to help achieving target we design. In implementing management, it should be there is a good cooperation between site users, committee and landscape manager. Committee constitutes as decision maker has important role because it is relating to regulations which is legally powerful to support or otherwise against the program proposed by planner or manager.

Regulations and acts that have been established by both national and local government do not take fully sides on a sustainable riparian area management. There are some regulations concerning to environmental issues such as Policy on Environment, National Spatial Planning, and Environmental Management Act (*UU No. 23/tahun 1997 tentang Pengelolaan Lingkungan Hidup/UUPLH*). There are other some law regulation regarding environmental management such as water and irrigation (*UU No. 11/tahun 1974 tentang Pengairan*) and water resources management (*UU No. 7/tahun 2004 tentang Sumber Daya Air*), however, only mention a little about environmental management issues (Arifin, 2009). For the decision maker, this condition is not enough. But, operationally, for micro-scale of landscape, it's necessary that national/local laws should be derived in detail regulations (Fig.4). Then it should be added with some specific points of Ciliwung riparian landscape management. Research finding shows that there are a number of feedback and suggestions of policies. They are for example: regulations on the border river, incentive system enactment to improve landscape quality such Adipura and Kalpataru Awards, competitions, tax reduction, etc., and disincentive system implementation aimed to prevent and overcome any deteriorations and landscape values degradation as well as environmental pollution such as pollution charges, fines, and detention.

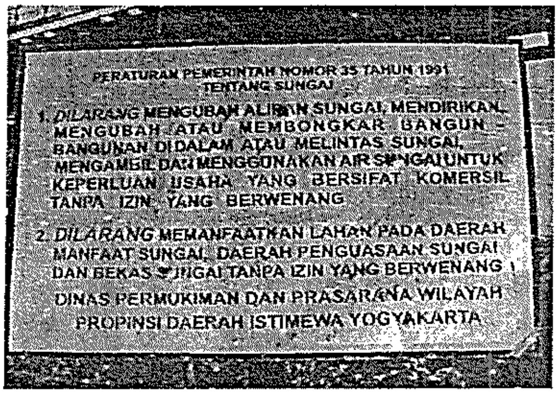

Figure 4. An example of local regulation of river in Yogyakarta and improvement of river bank landscape in Code River, Yogyakarta.

5. CONCLUSIONS

Positive cooperation between site users, committee and landscape manager is a must thing should be done to realize ultimate riparian zone management establishment. Either local or national regulation is nothing if it does not sustained by strong coordination at field and strict controlling coming from authorized party along with highly community awareness on environment. Given that community awareness, it could be shaped gradually through environmental extension, and formal or informal education. Cultural vibrancy found in community characteristic would be helpful in establishing sustainable riparian Ciliwung River.

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