



Ecological Modernization, River Revitalization, and Urban People Transformation

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Abstract. Ecological modernization is an attempt of responding to environmental problem arising without eliminating economic development attempt. This approach is in line with sustainable development principle and becomes a global political agenda. Ecological modernization commonly carried out in urban areas can be, among others, river revitalization. This research aims to explore the determinants affecting ecological modernization process, to describe transformation process in river bank people, and to explain contestation dynamics of actors' interest in revitalization of urban river bank. Joseph Huber's framework approach concerning ecological modernization theory was used to develop analysis and argumentation to explain river bank revitalization constructively and reflexively. Ethnographic method was used to dig in-depth and to reveal the ecological modernization practice in Yogyakarta City. Ecological modernization in Yogyakarta City has put river to be a part of the object of government for development and is supported by environment management, disaster risk mitigation, and tourism development policies. The program of managing slums in river bank is a meeting point to implement the three policies. This is important not only to protect the river bank people from cold lava hazard but also to be the way to make the river a city showcase supporting tourism development. The transformation process transpires culturally through river ecological recovery. The contestation of actors' interests arises latently and manifests leading to conflict and marginalization of actors' role. Collaborative approach is a new construction revitalization to reduce environment injustice arising due to ecological modernization.

Keywords: Ecological Modernization, River Revitalization, and Social Transformation

1 Introduction

Ecological modernization came up in early 1980s as a theoretical approach putting its position as a multidisciplinary study involving various approaches, social-political, economic, and environmental [1]. The ecological modernization approach was firstly used by Joseph Huber who coined the greening of industry theory. Huber gave emphasis on the need for fundamental environment improvement through innovation- and technology-based strategy to create efficient natural resource use and co-benefit to ecology and economy. Ecological modernization emphasizes that ecological rationality is necessary to compensate economic rationality so that production and consumption

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A. R. Cangara and S. Muhammad (eds.), *Proceedings of the Asia Pacific Sociological Association Conference (APSA 2024)*, Atlantis Highlights in Social Sciences, Education and Humanities 35,
https://doi.org/10.2991/978-94-6463-680-2_3

activities can benefit both economy and ecology. Basic assumption of ecological modernization is that economic growth can be reconciled with ecological conservation based on three strategies. The three strategies are production ecologization, improved regulatory framework and market for pro-ecological and greening social and corporate values as well as its practice [2]. As such, it can be seen that ecologic modernization is a solution to ecological crisis taken using holistic approach and thereby needing good environmental governance through technology, market, state intervention, and even social movement.

Ecological modernization theory is aware of the environmental damage occurring due to modernization on the one hand, but it does not agree with the radical greens' view that industrial modernization should be abandoned on the other hand. This theory argues that ecological crisis can be overcome using innovation technique and procedure. Modernization should be a means of waking up from environmental damage. Ecological modernization aims to establish harmonious relation between human and environment continuously. Ecological consciousness creates an environmental political discourse and is considered as a theoretical way strongly relevant to environmental planning and management and thereby can provide appropriate framework to explore the policy process [3]. This is intended not only to improve environmental condition through modern approach, but also to generate a number of economic benefits and advantages. Ecological modernization requires the importance of investment, innovation, and state intervention to achieve the environmental output expected. For that reason, ecological modernization approach needs environmental policy involving many parties, including civil society [4].

Studies on ecological modernization tended to be dominated by theoretical approach rather than empirical approach. It can be seen from a view that a well-developing social theory not only relates to politics and state, but is also about political environmental discourse and has been explored by Ulrich Beck in risk society theory [5]. The framework is developed in the context of climate change and environmental policy, and associated with green growth [6]. In addition to theoretical approach, empirical studies can also be found in ecological modernization aiming to enrich and strengthen the theoretical study through appropriate framework to explore the contribution of stakeholders to realizing sustainable environment [7],[3]. Nonetheless, the ecological modernization approach tends to be used in the context of developing countries, while in the context of developing countries it is still used rarely. Ecological modernization theorists recognize that research is still needed to put the approach into varying economic, cultural, and political situations [7]. Therefore, the expansion of ecological modernization studies in the context of developing countries with different social, economic, political, and cultural background compared with advanced industrial countries is a novelty.

Ecological modernization has been the mainstream in sustainable development discourse. This influences the educated people's view in big cities to understand that they can enjoy industrial product while still paying attention to environmental conservation. Economic modernization in developing countries is practiced in varying forms, e.g. behavioral change, lifestyle change, and improved standard management [8]. Natural conservation model is also a practice carried out in industrial and developing countries in the presence of donor institutions and non-government

institutions [9]. Natural conservation is needed to protect ecosystem and species, the existence of which is endangered.

Yogyakarta City is one of ecological modernization practices for urban society that is implemented in the form of behavioral change and natural conservation through river revitalization. The idea of river revitalization has come up since 2011, intended to three rivers crossing Yogyakarta city: Code, Winongo, and Gajahwong Rivers. This aims to make the rivers healthy and not bringing disaster impact and to prevent the settlement along the river from seizing the river's right. Thus, the objective to empower the people along the river bank can be achieved.

Study on river revitalization in Yogyakarta city finds its relevance because the study on river revitalization tends to give emphasis on technical aspect of river revitalization. The study involving socio-ecological factors underlying revitalization program, actors' dynamic engagement, and socio-ecological transformation process post-revitalization has not been conducted widely. For that reason, this article aims to explore and to explain the three matters critically and in-depth through Joseph Hubber's ecological modernization approach. This approach is important to be a means of reflection and evaluation on the river revitalization in Yogyakarta City.

2 Method

As a means of exploring and explaining in-depth and critically, an ethnographic approach was used. This refers Amir Marvasti's ethnographic idea mentioning typical characteristics of ethnographic research such as author's full engagement, exploring community's culture, and needing deep data interpretation. Thus, this discusses about engagement and participation in the topic studied, attention to social context of data collection, and sensitivity to how the researcher subject is represented in the research text [10]. The subject of research consisted of formal and non-formal actors engaging in river revitalization program in Yogyakarta City, including government, community, private, and university or college. Techniques of collecting data used were observation, in-depth interview, FGD, and documentation. Data were validated using source and method triangulations, and then analyzed using an interactive model of analysis [11].

3 Result and Discussion

Rivers in Yogyakarta urban areas are generally facing the same problems. Firstly, the problem related to the occupation of river bank land that should be morphological and ecological space for the river but is used as population settlement and other buildings [12]. The location of settlement and building with their backs to the river is an early marker of not-river-friendly behavior [13]. River bears rubbish and waste burden as the remains of urban people's life recycle. Ever degrading quality of river water endangers the supply of clean water to the citizens [14]. Additionally, not-river-friendly behavior also triggers the rise of slum settlement along the river bank. There is 264.9 ha-wide slum settlement in Yogyakarta, most of which are located in river bank area [15]. The presence of slum settlement not only increases the risk of flood disaster in rainy season and cold lava flood due to Merapi eruption. These problems and threats become

common complaint among citizens. If they do not move to mitigate the risk existing, they will be the first party affected by it. Therefore, an attempt should be taken to respond to the problem of environmental degradation in the form of collective action, including river revitalization.

The consciousness to carry out river revitalization came up since decentralization gave regencies/cities an opportunity of developing their own potencies. The complex challenge faced by Yogyakarta needs smart strategy in order to reconcile with various interests. The location of Yogyakarta city crossed by three rivers and having slum area in the river bank inhibits the city development process. Thereby, the river revitalization program as a way to create a beautiful comfortable city (to beautify city) is an important priority in the development agenda to answer the needs for environmental planning, disaster risk mitigation, and tourism development.

There are three regulations governing river revitalization through the scheme of city beautification. The first one is Mayor's Decree Number 557/KEP/2007 about Culture-Based Tourism Development, the second is Mayor's Decree Number 619/KEP/2007 about the Improvement of Environment Quality; and the third is Mayor's Decree Number 669/KEP/2007 about Disaster Risk Mitigation. The decrees or decisions are an important instrument of development agenda being the Yogyakarta City government's commitment. Agenda of environmental planning is an important agenda to the Yogyakarta City government that has slum settlement problem along river bank that can disturb "beautiful" image to the tourists visiting. A number of innovations is needed to increase the number of tourists through developing alternative tourism, one of which is through making the river a new arena. Thus, this can increase contribution to the Regional Original Income (Indonesian: *Pendapatan Asli Daerah* or PAD) including secondary impact in the form of multiplier effect on the economy of Yogyakarta City people.

River revitalization is also related to an agenda of disaster risk mitigation. Hydrometeorological disasters including flood, landslide, and tornado almost always occur during rainy season. The threat of cold lava flood disaster due to Merapi volcanic explosion occurring periodically should also be beware of. Even earthquake occurring on May 27, 2006 has given important lesson and new knowledge all at once about the importance of building disaster mitigation. One of its concrete manifestations is the development of disaster risk mitigation scheme, particularly in river bank risky of being impacted by those disasters. As such, the basis of knowledge about river revitalization in Yogyakarta City still underway in the three regions will intersect with the agenda of Yogyakarta City Government, including environmental planning, cultural tourism development, and disaster risk mitigation.

The river revitalization practice using ecological modernization scheme in Yogyakarta City involves not only technical institutions but also society element such as river community. Technically, river revitalization consists of river conservation, river development, and control of river water's destructive power. River conservation is carried out through the activity of protecting rivers, including riverbed, river border, flood exposure lake, and floodplain, river maintenance stream and river restoration section. In addition, the regulation on the extraction of river mining products and the restriction of riverbed use are also the part of river protection effort. Another river conservation activity in the form of the prevention of river water pollution is carried out through stipulating the capacity of accommodating pollution load, identifying and

inventorying liquid waste source coming into the river, stipulating precondition and procedure of liquid waste disposal, prohibition of rubbish disposal into the river, monitoring water quality in the river, and supervision of liquid waste coming into the river [16].

In addition to aiming to improve the ecological condition of river, the river revitalization can be river development through utilizing the river for household, farming, environmental sanitation, industry, tourism, sport, defense, fishery, electricity power generator, and transportation purposes. This is in line with an idea of ecological modernization intended to improve economic growth while still maintaining and protecting environment [2]. River development is carried out by not destructing river ecosystem, considering river characteristics, biodiversity conservation, and typical characteristics and regional/local people's aspiration. Nevertheless, the use of river is mainly intended to meet daily basic needs and people's farming in the irrigation system existing and to allocate the need for water for the river maintenance stream. Even the utilization of river cannot be carried out if it results in pollution and makes the water flow disturbed and/or river cliff collapse and particularly in the term of fishery, river environment's capacity and supportability should be taken into account [17].

The actors build and develop river revitalization actions physico-ecologically, and socio-culturally. These two types of actions involves various actors coming from civil society, state, private, politician, and university or college. The engagement of various actors result in the pattern of cooperation and collaboration with various actors enabling them to sit down together to equate view, thought, idea, and even interests to find better solution [18]. The collaboration between the parties can be social learning media among the parties and dialogue channel and media concerning various conflicts of interests arising among the parties.

The changing number of and type of actors engaging in river revitalization indicate varying interests existing. State actor is factually not single, but comes from different institutions with multilayered authority and responsibility. Community, as an important subject, is surely interested in better ecological, morphological, physiological, hydrological, and institutional conditions. Meanwhile, actors coming from university and private tend to play dual roles: supporting government's interest and node's interest. These interests are inherent part, either simultaneously or in parallel, during the river revitalization process.

The river revitalization process needs negotiation spaces among the parties. Negotiation approach is also relevant to the model of river stream region management in a number of countries. Negotiation approach is important in the context of decentralization providing bigger participation space to the people, particularly those living in the river bank. Negotiation approach is also viewed as a new approach to river shed (Indonesian: *Daerah Aliran Sungai* or DAS) management and is getting stronger as it pays attention to the principle of conservation and equal distribution of natural resource products [19].

The M3K (Javanese: *mundur, munggah, madep kali* or backward, upwards, facing the river) movement is the most important part in the river revitalization program. This program is under the patronage of KOTAKU program initiated by the Ministry of Public Works and People Housing (Indonesian: *Pekerjaan Umum dan Perumahan Rakyat* or PUPR). KOTAKU stands for *Kota Tanpa Kumuh* or City Without Slums, aiming to solve the slum settlement problem in river bank area to make it clean and

have tourism attraction. The approach implemented is M3K movement prioritizing river as the front yard as it will be the city's showcase. This can be accomplished through pulling back the citizen's settlement 3 meters from the river body (*mundur* or backward), raising the house building (*mungguh*), and changing the direction of house to face toward the river (*madhep*). The M3K movement gives an emphasis on the construction and renovation of buildings in the river bank to make them organized, clean, have road access, adequate drainage, clean water supply, rubbish management, liquid waste management, fire security, and availability of green open space for public interest. Thus, the social transformation process may occur in the river bank people.

Office of Living Environment affairs plays an important role in supporting rubbish management and actions of cleaning up the river through Clean River Program (Indonesian: *Program Kali Bersih* or PROKASIH). This program aims to create clean river free of wastes existing in the river base, beautiful and comfortable to see for the people living in the river bank, and thereby avoid from the risk of flood and a number of diseases. The action of cleaning river is carried out routinely by involving volunteers consisting students, university students, and army massively. This program is also labor-intensive in all village regions in the river bank with the activity of cleaning river done periodically particularly around and after rainy season. The implementation of PROKASIH refers to the result of academic study using physical and chemical indicator for the standard quality of river water. The realization of policy arising includes the construction of IPAL (Wastewater Treatment Installation), public toilet, retaining wall, and drainage in river islands (Suryopratomo, 2014). PROKASIH also should include social aspect to compensate the change of physical aspect. Thus, supporting modern knowledge and technology innovation are important in this program.

The development of river conservation through cultural approach aims to build the people's concern with the river. Through a participatory small study facilitated by the Faculty of Geography of UGM and a series of village discussion with various community leaders, an idea to hold *Upacara Adat Merti Code* (Merti Code Traditional Ceremony) is initiated. This activity is responded to positively by many parties. The Yogyakarta City's Office of Tourism Affairs even makes it the tourism attraction and routine annual agenda. In this case, university plays an important role to bridge the citizens' activism to the government. Unfortunately, the organization of *meriti code* ceremony as a form of education to the public about the importance of taking care of river still taking place in the north region of Code has not been followed yet by other regions.

The development of biotilic method to monitor the quality of river water is also used to build the people's consciousness of the river's ecological condition. This method was selected because there is awareness that the river water in Yogyakarta is severely polluted. Monitoring is also a part of alternative water source management to save water sources. Biotilic method can also mitigate the pollution of river water collectively and take fast measure to anticipate severer river damage [20]. Thus, this approach gives emphasis not only on curative approach but also on preventive approach.

Ecological modernization practice in river revitalization program can be viewed as a solution to environmental problem and can exist adjacently to social and political structure existing. The attempt of re-adapting the urban people to their living environment is taken through using advanced science and technology so that nature

supportability improves and sustainable development can be achieved [21]. The arrangement of river bank through M3K program is carried out using technical approach including river infrastructure that can retain the flood and socio-cultural approach to improve the people's behavior about river. In addition to paying attention to river interest as an ecosystem composing micro climate, the agenda of city development is also interested in making the river a city showcase. Through innovation- and technology-based strategies taken, an attempt of creating efficient natural resource use can result in co-benefits to ecology and economy [2]. As such, ecological modernization giving emphasis on the ecological rationality is needed to compensate economic rationality so that production and consumption activities can benefit economic and ecology all at once.

River revitalization is the representation of ecological modernization developed to respond to environmental problem and the need for the improved economic growth. The river revitalization program is not only aimed at improving ecological, hydrological, and morphological qualities of river to mitigate the disaster risk but also can be put as the recovery of natural capital to be used as alternative economic sources. It can be seen from the emergence of river tourism as new destination in Yogyakarta city area to complement other destinations. The decreased number of slum settlements in river bank as the implication of M3K program can improve the community's quality of life and can also be a new arena to develop micro economic business to support river tourism. Thus, river revitalization can improve exchange value and use value important in ecological modernization scheme.

River revitalization brings an implication to a social transformation process. The people's view on poor people's inability of managing natural resource in multistage can be changed by the river revitalization program. People are trusted to engage in the process of river revitalization program to grow their sense of belonging to the river being their living habitat. The mentality of river bank people concerned more with the river grows because the process of growing consciousness and environmental campaign. The growth of activism among the river bank people in maintaining the river cleanliness and utilizing river bank area as public space also accompany the social transformation process. The myth of lazy indigenous people considered as a factor inhibiting development is broken through the empowerment of citizens to engage in sustainable river management [22]. Thus, river revitalization as the representation of ecological modernization has encouraged the sustainable social transformation process.

4 Conclusion

In the relation between nature and human, ecological modernization has been the mainstream in the discourse of sustainable development. Ecological modernization needs a series of social and economic concepts, and specific science that can make calculation in environmental problem and facilitate the rationality in social behavior. Ecological modernization is manifested into river revitalization that can generate ecological, economic, and social benefits. The presence of modern science to respond to the need for environmental planning or management, disaster risk mitigation and tourism development has encouraged the emergence of river revitalization program. The actors engaged are not only dominated by the state but also involves the people

that have created participative schem in ecological modernization. The engagement of market can be seen from the presence of more pro-people new capital accumulation arena through river tourism that keeps growing along river bank. Thus, the river revitalization approach as the manifestation of ecological modernization becomes not only the space for negotiation among the parties, but also a space for utilizing economic source and ecology that is important to support the sustainable development.

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