Research Article

Transformation of River Restoration Movement Network

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Abstract.
A study on social network transformation of river restoration movement is very important as it is related to the network's ability of adapting to various changes and a movement's sustainability. This research aims to reveal the history of movement emergence, tactic, and strategy, process and procedure of social network establishment and social network transformation. An ethnographic approach was chosen by involving *Komunitas Pemerti Kali Code* (Code River Observer Community) as the main subject of current research. Data collection was conducted through live-in-society process for 2 months to conduct participant observation, in-depth interview and Focus Group Discussion. Data analysis was constructed using Mario Diani's theory about social movement as a network. The result of research shows that the first factor is the emergence of problem and grievance about river contamination by rubbish and waste due to people's poor literacy about river. The second one is movement strategy and tactic used in the form of structural and cultural approach to restore the river. The third is the process of creating social network based on shared idea, value, norm, collective identity, and interest related to the river. The fourth is social network experiencing transformation from spontaneity, institutionalization to autonomy phase as the attempt of adapting to and reconciling with the form of change to maintain the movement sustainability.

Keywords: *River Restoration Movement, Movement Strategy, Social Network Establishment, and Social Network Transformation*

1. Introduction

River restoration movement is a variant of environmental movement that has been popular since 20th Century. The popularity of river restoration movement is encouraged by the fact that a half of rivers in the world have been contaminated and in danger of drying out and thereby endangers the sustainability of 80% world populations [1]. People's consciousness of river sustainability increases continuously along with the civil society organizations mushrooming in many regions, even many of which establish social network in various scales [2],[3]. The people's increasing consciousness gets political legitimacy in UN's Declaration of ecosystem restoration in 2021-2030 decade requiring a region to be able to adapt to the effect of climate change [4],[5]. A number of

river restoration movement agencies have been established in many countries by prioritizing more the ecological aspect of river than the social-cultural aspect (6),(7). Social cultural aspect should get much attention recalling the people's varying narrations and knowledge on river and thus the restoration movement strategy should be developed continuously. Referring to some argumentations aforementioned, the theme of river restoration movement finds its urgency.

So far studies on river restoration movement tend to pay much attention to phenomenon and macro process of movement. Just like resource mobilization and political process perspective explaining the emergence of river restoration movement (8),(9),(10),(11), the perspective of collective framing and identity explains the movement operation process and varying tactics and strategies used (12),(13). In the attempt of enriching analysis of river restoration movement and revealing the dynamic of movement comprehensively, mezzo and micro approaches are needed concerning rational and transformational elements of social network in addition to macro approach found commonly so far. One of popular and promising approaches to reveal the relational and transformational elements is suggested by Mario Diani in his idea about social network as a movement that believes that social network serves as a vehicle to achieve the objective of movement and as the factor creating the movement all at once. A social movement is also called a typical social process involving informal interaction network between individual, group, and society pluralities that are involved in political or cultural conflict based on common identity (14),(15),(16). Social network approach develops inadequately in the context of river restoration; thus this approach is considered as merely capable of enriching the analysis of movement but incapable of revealing the procedure and the process of establishing social network, alliance scheme and coalition, and social network transformation adequately.

2. Method

Ethnographic was selected as it can reveal in-depth the history of river restoration movement emergence and the dynamic transformation of social network property of the movement (17),(18). The subject of research is the actors of Code River Observer Community in Yogyakarta City who have built the movement since 1999 and considered as capable of inspiring the similar movement in other regions. The strategy of collecting data was conducted naturally through live-in process and participant observation for two months (19), conducting in-depth interview and Focus Group Discussion (FGD). The primary data included field notes, interview transcripts, and photographs and videos

of community activity. Secondary data included community document, newspaper clipping, data from Central Bureau of Statistics (BPS), reports on community activities, and recording of community activities in social media such as *Instagram* and *facebook*. The data were processed and organized by encoding them and classifying them based on prominent typology and specific theme. Inductive analysis was chosen to reflect and to make dialogue about the processed data, the author's ideas, and the theories used (19). The use of source and theoretical triangulations (20) is expected to get feasible data validity and analysis framework.

3. Result and Discussion

3.1. Problem, grievance and Code River Movement

Code River belongs to Opak Watershed in Yogyakarta Special Region (*Daerah Istimewa Yogyakarta*) and has a length of 45.25km and an area of 45.56km^2. This river became popular since cultural movement by Romo Mangun in 1984. More than ten years after the cultural movement initiated by Romo Mangun, a group of people in Kampung Jetisharjo was restless with so many rubbishes and wastes entering into Code River and inhibited the river stream, and thereby resulted in puddle and even flood during rainy season. Consequently, the people cannot utilize river ecosystem service optimally. In addition, the growth of settlement along Code river bank due to urbanization current has led to the development of slums (22). This condition was worsened by the community culture still positioning river to be the "backyard" (23) connoted to be a place for disposing anything unused. The view is an indication of the people's poor literacy about the function of river. Considering this, a group of people living in Jetisharjo area, a kampung (hamlet) in the edge of Code River of Yogyakarta was motivated to do community service (*kerja bakti*) and mutual cooperation (*gotong royong*) to clean the river from rubbish and waste.

In addition the real action, education about the importance of taking care of and maintaining river was implemented through *kampong* meeting, posting poster about the prohibition of disposing rubbish in the river and inviting everyone to manage rubbish up to household level. The movement spread and transmitted to the people of *kampungs* surrounding to do similarly. The people's strong wish and awareness of the river cleanliness encouraged them to establish North Code Community Communication Forum (*Forum Komunikasi Masyarakat Code Utara* or FMCU) and Code Lover Community (*Komunitas Pecinta Code* or KOMPAC). Meanwhile, Code Love Movement (*Gerakan Cinta Code* or GCC) existing in *Kampung* Keparakan, South Code area, instead has

initiated a river cleaning movement since 2000. As such, the river restoration movement became a need to the people living in the river bank and then become a public practice that continues to grow (24).

The Government of Yogyakarta City welcomes enthusiastically a variety of community initiatives to improve river condition through establishing communication forum between communities in an organization called *Pemerti Kali Code*. This forum established on June 28, 2009 aims to connect various communities in the Code River bank to each other to mitigate the disaster risk by maintaining river and arranging the river area. This forum determines to make Code River clean as the front face of Yogyakarta City.

3.2. Movement Tactic and Strategy

There are two river restoration movement tactics and strategies: structural and cultural strategies. Structural strategy is implemented in the form of movement having direct impact on the river restoring attempt through improving hydrological, ecological, and morphological aspects (25). The river cleaning movement is conducted voluntarily by involving such parties as Higher Education through research and community service program and Living Environment Office in collaboration in Clean River Program (*Program Kali Bersih* or Prokasih). The river cleaning river aims to improve ecological aspect of river and to ascertain the clean river from various types of rubbish. Additionally, the movement is an attempt of reducing household waste contamination and the waste of Micro-, Small-, and Medium-scale enterprise (MSMEs), *Pemerti Kali Code* community in collaboration with Gadjah Mada University (Universitas Gadjah Mada) to manage the wastes to make the water entering into the river free of pollutant. The attempt of improving hydrological and morphological aspects is supported by River Basin Research Station (*Balai Besar Wilayah Sungai*). The communities cooperate to build Green Public Spaces along the river bank, to construct communal Liquid Waste Disposal Installation (*Instalasi Pembuangan Air Limbah* or IPAL) in the kampong, sowing endemic fish seed and processing rainwater before it enters the river body. Although it has been implemented in some river points, this movement becomes a media of educating the people about the importance of maintaining and improving the hydrological and morphological conditions of the river.

The arrangement of settlement in the river bank is also conducted by Public Work and People Housing Office to make the river has adequate ecological space to buffer the water stream. Moreover, most of river bank areas have land with "*wedi kengser*" status belonging to Keraton Yogyakarta (Yogyakarta Palace). Thus, the people dwelling

it have "*ngindung/magersaren*" status or the right to use only. As such, some attempts are taken continuously to relocate the people to the flat provided by government, particularly for the people affected by cold lava flood in 2010 in Jogoyudan. Meanwhile, some people are still living in the river bank and attend the program *Mundur, Munggah dan Madhep Kali* (M3K) (the program of going back, up, and facing the River). The status of use right facilitates the process of arranging slum areas. Thus, the river is expected to have adequate ecological space. The two strategies of arranging settlement are not separable from the Yogyakarta City Government's attempt of reducing slum area in the river bank (22). The settlement arranging process is still running until today with the varying conflict dynamics.

Although the arrangement of area has not been completed yet, to *Pemerti Kali Code* the program is a part of cultural movement to improve community literacy about river. The role of community is to give education about the importance of changing the wrong perspective positioning river as the backyard or river back into the river front (23). If the river is the front yard, it is identical with the face that should be adorned tidily and cleanly. This attempt is supported with rubbish bank institutions established in the kampungs, and thereby river will not be the rubbish disposing arena.

The popular cultural movement conducted in large scale is *Merti Code* ceremony. Campaign and education are the main goals of this movement, targeting not only the people living in the river bank but also other people. *Merti Kali Code* is a local genius attempt to manage and to preserve environment (26). Through Tourism Office's support, this cultural movement starts with taking water from seven water sources existing along the Code River. Water is important to Javanese community life, as it as considered as the origin of life on which the human life concentrates (27). Furthermore, water is put together into earthenware jug symbolizing the uniting of intentions to maintain and to clean the river. In addition to maintain "*guyub rukun* (communality)" and *gotong royong* (mutual cooperation), *Merti Kali* ceremony with all of its activity series has successfully gotten people's sympathy and attention, leading to the meeting point between community-nature and social-cultural environment-including government.

3.3. Social Network Establishment

The process of recruiting movement actors is an early step to expand the movement network in order to strengthen the support from many parties. The recruitment process in river restoring movement is conducted not only formally and informally, but also using friendship (individual) and institutional (organization) lines (31). The *Pemerti Kali Code*

Community post-establishment, the socialization is made by the key actors to local institutions of Kampung, Kelurahan, Sub District, and City. It is intended to build synergistic movement and to equate the vision of Code River management. Nevertheless, formal process is not easy and thereby should be followed with informal process to achieve the same perspective. In the context of Code River, the actors of *Pemerti Kali Code* community admit that institutional support can be achieved easily when the key actors of the movement are the part of *kampung's* institutional structure. Somehow, the attribute inherent to the actors in institutional structure becomes a social capital to make socialization, to exchange the objective of and even the ideology of movement (31). As such, program integration and synergy can be done easily. Meanwhile, individual line in expanding public participation and support can be implemented more easily than institutional line, particularly if individual relation has been established previously. Individual proximity facilitates the identification of identity, value, and interest and therefore, the shared perspective and action can be achieved through the river restoring movement (32).

Whereas, to ensure that the recruitment process can build synergy and broad support from many parties, the process of socialization is required through identifying identity, value, and interest inherent to each of actors (28). Identity as "*Girli* (river bank)" people is embedded to those living along river bank. They are the first ones to be blamed when the river is damaged and contaminated, and the first ones to be the victim of disaster affecting the river areas. Because of the typical identity, the awareness of building solidarity among "*Girli*" people is grown spatially to create an integrated movement for the people in upstream, middle, and down stream areas. Through the increasing support from the actors in many regions, the solidarity of "*Girli*" people marks the emergence of the spatial network of movement. Eventually, the social network built can strengthen individual identity and grow political consciousness to be aware of the problems in their environment (12).

The process of identifying norms and values concerning the importance of maintaining and preserving river becomes an important process to the establishment of social network. Through social interaction process, a dialog occurs about norms and values the actors of movement have and thereby leads to appreciation and recognition. Moreover, most of "*Girli*" communities are urban communities with diverse ethnicity compositions of population. In dealing with the river degradation problem, local culture can be a means of uniting those diverse ethnics. Because most of people come from Javanese tribe, Javanese cultural values are used as the cultural strategy of river restoration movement. One of them is Javanese values about "*Merti*" as adopted in

Merti Kali Code ceremony. In Javanese culture, everything, including river, should be cleaned periodically (*merti*) to avoid adverse effect or disturbance to their life (26). The recognition of communities' local knowledge in the form of Javanese values is important not only to social network establishment, but also to the sustainability of river restoration movement (29).

Pemerti Kali Code is aware of the need for expanding other people's support in the river bank. The background of key actor as the head of RT (Neighborhood Association) and *Takmir Masjid Jetisharjo* (Management of Masjid Jetisharjo) makes the early stage easy in getting support from other actors. The factor also becomes "personal guaranty" to grow trust leading to the establishment of social network. Through (Islam) religious approach, socialization is made continuously about values and idea and knowledge exchange concerning how to maintain the environment, particularly river, and thereby *Forum Silaturahmi Masjid Code* (FSMC) is established. The forum becomes an environmental education media based on Islam values and intended particularly to the santris in Masjid affiliated with FSMC. Despite its less broad coverage, the establishment of social network is an attempt of ensuring the sustainability of river restoration movement.

The attempt of broadening social network also can be taken through manage the interest of "*Girli*" people in the ecosystem service produced by the river. There are four types of ecosystem service the Code River provides: *Provisioning Services* (providing clean water, food, hydraulic energy, and biodiversity), *Regulating Services* (regulating climate stability, nutrient absorption, and flood controller), *Cultural Services* (cultural, knowledge, esthetic, and recreational development) and *Supporting Services* (creating landscape and habitat) (30). Pollution and degradation risks have endangered the Code River's ability of providing the four Ecosystem Services optimally. The people's initiatives to manage the ecosystem service manifested into settling the slums, cleaning the river, sanitation, biodiversity, rubbish bank, and ecotourism management need synergy and integration with river restoration movement. Some institutions have been established to support those varying initiatives by involving government, higher education (universities), religious group and private sector. Through varying activities, the interaction process to establish social network has good governance and supports the river restoration movement. As such, the organization of institutional network in the movement united by shared interest in supporting the management of river ecosystem services is an important measure to make the river manageable justly and sustainably as common pool resources.

The development of information technology is a medium of creating social network. Through communication mediated by various technological tools, space and time can be

broken through easily, because we are now entering network community era (32). The typical characteristics of Code River as the channel of cold lava flood due to Mount Merapi explosion force its people not only to care of the rubbish and waste contamination but also to be alerted to the periodical disaster risk. The river restoration movement is an important part of the attempt of mitigating the disaster risk. Therefore, the process of building upstream, middle, and down stream areas should be implemented particularly by utilizing social media and community radio to communicate, to share information, and to discuss with each other (33). Social networks in community radio media include Pareanom, Code X, RISIP 258 and Tugu 905. Although these networks are virtual ones, their existence can benefit much the people, and thereby can anticipate the damage due to disaster.

Some forms of social networks tend to be liquid and not bonding. The social networks established unite not only individuals but also organizations and even events, and thereby generate a movement. A number of commemorations for celebrating Living Environment Day, Earth Day, and River Day is used as the momentum to take common action and to campaign for ensuring that the values of river maintenance have been inculcated well. The existence of social networks has not contributed considerably yet to the river restoring attempt, but it tends to be an attempt of improving (restoring) the community's river literacy. This attempt should be taken routinely with broader coverage, to keep sowing the values concerning the importance of maintaining the river.

3.4. Social Network Transformation

The river restoring movement in Code has occurred for more than 20 years. *Pemerti Kali Code* as a social network between river communities that connects the river restoring movements in some regions keep changing and transforming. Referring to an idea that a movement is a typical social process, the movement of social network has dynamic due to both internal and external factors. Social movement change and transformation, according to Sidney Tarrow, can be affected by some factors: political opportunity availability, movement group's preparedness, movement framing availability, and movement innovation availability (34).

During 20-year period of social network establishment, the social network transforming process in the river restoring movement can be divided into three important phases: spontaneity, institutionalization, and autonomy. Spontaneity phase is an early phase of the emergence of river restoring movement characterized with ecological problem and grievance felt in local scale or *kampung* about Code River. Just like mutual

cooperation pattern implemented based on the interest in *kampung* cleanliness, its movement is ecological interest-oriented. Mutual cooperation requires voluntary and autonomous spirit as it has typical characteristics and is not related to the interests of other *kampungs*. Such movement pattern has short term effect and is localistic. Meanwhile, river has an integrated character between *kampung* and river areas, and thereby an attempt of building interaction and dialogue is taken. The attempt is relevant to an Idea of Yogyakarta City Government to arrange the Code River region to free it from the predicate as slum area and to mitigate the effect of disaster flood (35). Government makes some interventions to connect some Code communities through *Pemerti Kali Code*; therefore some agendas are added to the objective of movement. They include not only agenda to restore physical and ecological aspects of the river by making the Code River clean and the front river of Yogyakarta, but also agenda to make Code a tourism region in Yogyakarta city. This phase can be defined as an institutionalization phase as it is legalized as a formal institution.

The actors and the communities affiliated in this *Pemerti Kali Code* community are not homogeneous, but depart from heterogeneous problems, potencies, and interests. The orientation of river restoring movement is not purely based on ecological interest, but economic interest is inserted by the Government into this network. The dual role played by this network is supported by the City's Living Environment Office through *Merti Kali* (cleaning the river) program, Public Work and People Housing Office through arranging the settlement, Tourism Office through establishing Tourism-Conscious Group, and Higher Education through research and community service activities. The supports from many parties, in fact, generate some problem in its implementation. Limited budget to supporting the river restoring movement can reach some kampungs and rivers only. In addition, the elite leader of network should be able to ascertain the preparedness of individual kampungs and rivers socially. Thus, social envy and latent conflict begin to appear among the members of social network. The dual role that should be played by the movement network is not accompanied with the inadequate supporting institutional capacity; therefore, this institutionalization of communities becomes social burden to the elite leaders of social network. Thus, they make common reflection and result in an idea to develop kampung and river autonomously by each of communities.

Pemerti Kali Code transforms itself into a communication forum to exchange ideas and thoughts about the river restoring movement. This phase can be called autonomy phase. Furthermore, the autonomy phase tends to give the communities affiliated with the *Pemerti Kali Code* social network the freedom to make improvisation and innovation based on need, orientation, and movement strategy they have (36). They pay much more

attention to strengthening the social network in *kampung* institution and thereby it can be integrated into other *kampung*-based programs to keep sowing communal values and sense of belonging. They develop a principle that if *kampung* and river are clean, they can be the magnet to tourist visit. Thus, ecological orientation remains to be priority and foundation to develop a *kampung* and river-based tourism.

The three phases run naturally and are found commonly in the environmental movement pattern in other regions, as suggested by Luther P. Gerlach in his idea about the evolution of environmental movement through segmentary, Polysentric dan Networked (SPIN) phases (36). Those phases indicate the actors of movement's ability of adapting to any challenges and problems encountered. Thus, these phases become communal need to manage the network justly and democratically without leaving the common objective of the river restoring movement.

4. Conclusion

The emergence of river restoring movement is characterized by the ecological problem of river that is localistic in nature and keeps broadening and thereby becomes common grievance. The restoration movement does not stand on empty space, but it is connected to various groups with varying identities, ideas, values, and norms. The process of socializing and identifying the four aspects is the entrance to the growth of trust and becomes the early process to establish social network to broaden support and participation in the movement. The social network established tends to be liquid and not binding to certain objective and interest. Considering this, they establish social network to support the effectiveness of movement and as the attempt of broadening support and participation from other community groups. The social network transforming process is affected by both internal and external factors, divided into three phases: spontaneity, institutionalization, and autonomy. The typical social process is viewed as the consequence of the attempt of reconciling with the conflict risk and the middle way in the ever-developing dynamic of actor interests.

Empirically, the social network transformation in restoration movement will has an implication to the sustainability of movement replete with the dynamic changes occurring continuously. Theoretically, social network approach as a movement in fact has some limitations in revealing the external factor causing the transformation of social network in the river restoring movement. Eventually, methodologically, it also has an implication to the opportunity of using mixed methods - ethnography and Social Network Analysis – to get more comprehensive understanding.

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This research has some limitations in revealing in detail the external factor in the river restoring movement, particularly the local political dimension developing and operating, and thereby affecting the dynamic of movement.

Conflict of Interest

Herewith the author declares that there is no conflict of interest contained in this article publication.

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