

River community agency in mitigating disaster risk

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Abstract. Community plays a central role in disaster risk mitigation discourse and practice. This article explains important factor affecting the emergence of river community agency in disaster risk mitigation and agency form and pattern performed by river community. River Community in Yogyakarta city is selected to be the research location using multiple case study. The result of research shows that river community agency is affected ecological complaint and disaster experience harmful materially and non-materially. The agency pattern performed consists of structural and cultural agencies. Structural pattern gives emphasis on actions related to the attempt of restoring one of river's functions as disaster organizer. The form of structural agency is manifested into some actions: cleaning river, saving river border, and organizing slums. Cultural agency gives emphasis on the attempt of improving environmental consciousness and interest in increasing the capacity of suppressing vulnerability. The form of cultural agency is facilitated through river school playing an important role in improving knowledge and capacity concerning environment and disaster. The two agency patterns become an integrated strategy to create a disaster-resilient community.

1 Introduction

This article is urgent because civil society agency plays a central role in disaster risk mitigation, particularly in suppressing material and non-material impacts of disaster. The issue of disaster risk mitigation also has significance in Indonesian context, because Indonesia is on the third rank in the world for the countries often affected with flood, following China and India [1]. Flood incidence frequency increases over years, and so are its intensity and spread. In addition to being affected by global climate change, particularly rainfall, it is also affected by land conversion, the river bank used for settlement and industrial purposes, rivershed damage and etc. [2]. The increased incidence rate of natural disaster is an indicator of unsustainable development.

The integration of development into disaster risk mitigation has been a new paradigm in global disaster management. It is manifested into collective consensus included into “**Hyogo Framework Action (HFA) design of 2005-2015**” to enable the state to integrates it into development policy. It is because when economic globalization process has brought material

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prosperity to some communities but resulted in greater risk of exposure for some other communities. Thus, the paradigm of disaster risk mitigation replaces responsive paradigm and recovery is the measures to reduce vulnerability in the context of development. Consequently, the participation of many parties is required to develop community resilience to suppress the vulnerability to disaster effect [3]. One of parties playing important part is civil society.

The participation of civil society in disaster risk mitigation in Asia keeps developing and gets stronger. Even South Asia is considered as the house of civil society and has solid social network. Several Non-Government Organization (Indonesian: *Lembaga Swadaya Masyarakat*, thereafter called LSM) previously development-oriented have change their activism in disaster risk mitigation. They receive recognition to be an important agent nationally and globally [4]. The movement of civil society concerned with the issue of disaster risk mitigation has disseminated and disseminated to some areas in South East Asia, including Indonesia.

Following the 2004 Aceh Tsunami and the 2006 Yogyakarta earthquake, the large wave of civil society agency in disaster recovery management keeps growing and developing. Culminatively, in 2012 Indonesia was awarded for its ability of integrating disaster risk mitigation into Yogyakarta Declaration as the national priority. The main idea of such declaration is to put community to be investment in disaster management and the agent encouraging toughness [5]. Since then, a number of disaster alert groups and communities began to be established and various fund assistance sources were also present to enliven the global party of disaster risk mitigation. A number of disaster communities have been established by government: Disaster Resilient Village (Indonesian: *Desa Tanggung Bencana* or DESTANA) established by BNPB, Disaster Resilient Community (Indonesian: *Komunitas Tanggung Bencana* or TAGANA) established by Social Ministry. International Federation of Red Cross and Zurich Insurance in collaboration with Indonesian Red Cross (Palang Merah Indonesia) have developed Flood Resilient Community Program (Indonesian: *Program Masyarakat Tanggung Banjir* or MTB) in Indonesia [6]. Some of those communities have developed a number of dynamic and varying agencies.

Civil society agency implements disaster risk management based on disaster characteristics and society's ability of reducing or mitigating the vulnerability occurring. The prominent form of civil society agency in Indonesia is, among others, its participation in advocacy and drafting disaster management law. Civil Society Organization (Indonesian: *Organisasi Masyarakat Sipil*, thereafter called OMS) such as National Commission on Violence against Women (Indonesian: *Komnas Perempuan*), *Kehati*, Women Solidarity and some other OMS monitor the problem of vulnerable groups in disaster management [4]. Some others role are also performed, for example: facilitating the process of recovering the livelihood source of disaster victim to reduce social and economic vulnerability [7]. It can be carried out through improving the community's capacity [8], particularly through the active role played by women and other vulnerable groups like diffable to serve as disaster survivor [9]. A number of local communities even keep continuing their agency through the activities of mitigating disaster and risk. Studies on the form of pre-disaster agency for risk mitigation are still limited in number. Therefore, the studies on the topic should be increased in order to contribute to the attempt of suppressing adverse effect of disaster. As such, this study is getting more relevant, particularly in Indonesia that is vulnerable to disaster incidence and this is the novelty for similar studies.

This study aims to analyze (i) factors affecting the emergence of civil society agency in mitigating disaster risk; and (ii) form and pattern of civil society agency in mitigating disaster risk. The idea about agency is getting more popular in social science. Agency is different from action. The idea of agency refers to an actor/agent's ability of thinking, behaving, and acting independently, freely, and autonomously, and volitionally. Therefore, Emirbayer and Mische confirms the idea of agency in three elements: *iterational*, *projective*, and *practical-*

evaluation. Iterational element emphasizes past-based action, projective element emphasizes future-oriented action, and practical evaluation element emphasizes the present-oriented action (10). It is this agency theory framework that frames the study on civil society agency in disaster risk mitigation.

2 Research method

This is a multiple case study because it uses several river communities through employing a case of river community agency in mitigating disaster risk. This method can indicate different perspective and experience among river communities on an issue investigated [11]. The subject of research consists of actors of *Pemerti Kali Code*, *Forum Komunikasi Winongo Asri Communication Forum* (FKWA) and *Forum Silaturahmi Daerah Aliran Sungai Gajahwong* communities in Yogyakarta City. Strategies of collecting data used are participant observation, in-depth interview and *Focus Group Discussion* (FGD) [12]. Primary data includes field note, interview transcript and photograph and video of community activities. Secondary data includes community document, newspaper clipping, Central Bureau of Statistics (BPS)' data, report on community activities, and recording of community activities in social media such as *instagram* and *facebook*. Data was analyzed using inductive method by reflecting theory and data obtained [13]. Source and theoretical triangulations [14] are expected to obtain data validity and comprehensive analysis frame.

3 Result and discussion

The number of populations growing and developing in Yogyakarta City triggers the decreased environmental supportability. Flood incidence affecting Yogyakarta City in 2011 has brought thousands tons of cold lava and it was reported that 980 houses were submerged, 5,700 people were evacuated with material loss of more than 115 billion rupiah [15]. The Problem of flood disaster has been a periodic threat against the people living in river bank. Therefore, the civil society agency is very important to build disaster resilience.

River community is a form of civil society in Yogyakarta playing an important part in disaster risk mitigation. They develop their actions to recover ecological, morphological, and hydrological condition of rivers to restore one of river's function as the organizer of flood disaster [16]. The determinant of river community agency in disaster risk mitigation is, among others, the factor of experience being the victim of flood disaster annually. The experience has built new consciousness of the importance of improving both individual and collective capacities. The factor of knowledge on the impact of disaster and the capacity of reducing vulnerability likely occurring can contribute to the preventive improvement of social and physical capacities of community that are important to mitigate disaster risk [17]. The community's ability of building its capacity of dealing with emergency, particularly of reviving and learning from experience will make physical, social, and political structures in line with environmental condition [18].

Referring to Emirbayer and Mische's idea of agency (1998), the river community agency is a form of spontaneous voluntary initiative. Volunteerism is always associated with help, concern, service provision, leisure time activity and association supporting democracy [19]. This volunteerism is related to mutual cooperation culture of Yogyakarta people becoming an important part in the community's life system. Volunteerism and mutual cooperation also underlies the development of social capital. The presence of social capital in many disaster cases can reduce vulnerability and grow resilience in dealing with disaster. Resilience in dealing with disaster is the main goal in disaster risk mitigation including ecological, economic, and social resilience [20].

The concepts of resilience and social resilience have a long history in social theory [21]. The concepts not only involve past, present, and future processes but is also associated with social capital as these enable either individual or group to achieve its objective through social network, reciprocity relation, and trust [22]. Even in Tocqueville's view, citizens can act together freely in a community and use the civil society institutions such as worship place, volunteer association, press, and etc. that can take act immediately to solve the problem faced. They do not wait for higher authority to solve problem, but they join other communities [23]. Several forms of river community agency intended to improve environment and to deal with the impact of disaster strengthen its role and position in mitigating disaster risk.

Generally, there are two forms of agency initiated by river community in mitigating the disaster risk: structural and cultural agencies. Structural agency integrated into village's routine agenda is *merti kali* or cleaning the river to remove rubbishes inhibiting the water flow from the river. Uncomfortable conditions such as puddle, mosquito and bad odor encourage them to get out of such situation. Therefore, cleaning village and river together is the beginning of people's concern with river condition. Just like the rational choice theory studying the emergence of environmentalism driven by complaints leading the actors to move toward changing the environmental condition into the better one, the collective action has been the village's routine agenda and in certain period of time has been a part of a series of *memetri kali* traditional rite [24].

Saving river border is also a form of dynamic structural agency involving many stakeholders. The agency supported by River Basin Research Station (Indonesian: *Balai Besar Wilayah Sungai*) and Yogyakarta City government aims to restore river border into open green space and support urban environmental planning [25]. This action is carried out because river border that should be morphological space for river and creating urban micro climate has been pushed aside by urban development interest. If river border is not saved, the risk of hydrometeorological disaster impact will endanger settlement and harm the community's life system [26]. Therefore, river community facilitates socialization process along with the heads of neighborhood association and citizens association administratively adjacent to river border that will be saved.

River border is an area prioritized to be released and restored to their function as an urban open green space. Based on the data of Yogyakarta City's Detailed Spatial Planning (Indonesian: *Rencana Detail Tata Ruang* or RDTR), river borders covering 0.7802 ha-wide area in 17 locations along the river have been successfully released and converted into recreational parks contributing to the wider area of public green open space. Gajah Wong River Border has 9 locations allocated to be Open Green Space with a total breadth of 6,500m². Meanwhile, the other 8 (eight) locations are distributed in Code and Winongo river borders with a total breadth of 1.200m² [27]. Open green space area (Indonesian: *Ruang Terbuka Hijau* or RTH) then functions to help restore the river's degraded ecosystem to facilitate the process of improving micro climate in urban areas. Thus, the risk of disaster due to climate change can be reduced.

The most popular form of agency for saving river becoming trademark in managing slum neighborhood in Yogyakarta City is M3K movement. The settlement in river bank area is a long phenomenon occurring due to urbanization current having taken place since the RI's independenc. Post-regional autonomy of 2000, the government manages the settlements in the river bank and prevents them from being slums for urban beautification purpose. This M3K movement seeks to tell the citizens to reduce their house area protruding to the river by 3 m, change their facing direction to the river and raise their house building to reduce the risk of flood [28]. This M3K movement not only saves river border area for the sake of river as an ecosystem but also reduce the risk of disaster that can affect the people living in the bank of river.

The management of settlements as the form of education for the people in the river bank has also been conducted in a number of countries in the context of river restoration. Just like what has occurred Los Angeles as reported by Esther Kim concerning the process of organizing the Black settlement along the river replete with conflict dynamic [29], the story of Mellaca river restoration in Malays also used some methods to change the people's perception on the river by rediscovering the old stories [30]. Both stories become important reference to educate the people living in the bank of river through managing the settlements in the river bank.

The form of cultural agency in the disaster risk mitigation aims to build public consciousness of environment and the attempt of mitigating disaster risk. The form of cultural agency getting public attention is river school. There are two prominent approaches: biolytic approach developed by FKWA and educotourism approach developed by PKC. These two different approach options have different context related to the context of actors involved and different ecological arena leading to different strategies and approaches as well. Nevertheless, river school developed in both communities aims to improve the people's consciousness and concern with river.

River school has been developed by FKWA in collaboration with some institutions like Walhi, BLH, BNPB and universities in Yogyakarta using biolytic approach. This method aims to monitor the quality of river water and it is the entrance gate to build the people's consciousness of river ecological condition. The quality of river water is monitored periodically once in six months using a strategy of dividing the monitoring location into three areas: upstream in Sleman, middle in Yogyakarta and downstream in Bantul. Biolytic method is carried out through monitoring the quality of water using living creature (macroinvertebrate) as an indicator, including water insect, shrimp, and worm. This method was selected because the condition of river water pollution in Yogyakarta belongs to severely polluted. Monitoring is also a part of alternative water source management to save water sources Sleman [31].

River community PKC preferred using educotourism in cultural approach through river school. Historically, the pioneer river school can be traced back to the development of Code tourism beginning to be performed in 2011. At that time, the sidewalk was constructed in the riverside intended to *riverwalk* Code tourism. In addition to aiming to enjoy the beautiful contour of Code River, this sidewalk can be used as a means of evacuation during disaster. Post-cold lava disaster in 2011 affecting Code River, an initiative appeared to develop river school that accommodated tourism, education, and disaster mitigation interests. Since then, educotourism method was considered as a realistic choice considering the capacities and the needs of people living in Code river bank.

Cultural approach through river school plays an important role in mitigating disaster risk. This agency refers to the framework of understanding that river pollution and degradation occur due to human activity and behavior. The attempt of changing people's behavior against the river is important amid an understanding on *the cournopia view of the nature*, believing that nature is vast and boundless. Similarly, the environmental ethic developing today is anthropocentric ethic putting nature or in this case, river, to be a means of sufficing human needs. Equipped with these two conceptions, human beings can act unlimitedly according to their wish and interest, regardless that nature has very limited capacity of satisfying their wish and interest. This conception having been inherent to the people should be changed to change their behavior against river [32].

River school becomes a strategic action because the appearance of ecological crisis threat is one of factors encouraging human beings to save ecosystem in their surrounding environment, including human life. Environmental education is a transformative attempt to encourage environment saving movement or action [6]. The education for saving environment is manifested into, among others, river school. In global context, river school

can be considered as the manifestation of SDGs, conserving and utilizing marine and ocean resources sustainably for the sustainable development. River school functions not only as a learning medium for the community but also as an attempt of improving the community's knowledge and consciousness of environmental issues. River School is also important to provide the people (community) with ability and knowledge on environmental and social-cultural problems, etc. River School is considered as capable of accommodating the people's need to learning river management and disaster mitigation process.

River communities have a strategic role in managing disasters in the Yogyakarta river area. This is because they are the community group that first received the impact of the disaster. Strategic roles are needed in the form of structural and cultural agencies that are distinctive and unique because they have a big impact on individuals, communities and society at large. Much agency is the product of complex interactions between individuals, communities, their surroundings, and the natural environment itself. River border rescue agencies must be carried out because they are related to the ecological restoration of rivers and to reduce the impact of cold lava flood disasters. Even though it causes conflict between residents along the river, it is done through dialogue and 'musyawarah kampung'.

4 Conclusion

Disaster risk mitigation has been a global sophisticated paradigm in disaster management. In Asian scope, the civil society agency has significance in disaster risk mitigation because of its varying actions and dynamics. The river community agency in disaster risk mitigation in Yogyakarta City is affected by two factors: environmental consciousness and disaster experience. Both factors create knowledge to improve physical and social capacity to reduce the vulnerability due to disaster. The pattern of agency development includes structural and cultural agencies that is integrative and complementary in nature. Structural agency intervenes in the restoration of one of river's function as the regulator of flood disaster embodied into some actions: cleaning river, saving river border and arranging the settlement in river bank. Meanwhile, cultural agency facilitated by river school is intended to improve the people's consciousness and concern with disaster and environment. Structural and cultural agencies are solid formula to improve social and physical capacities in mitigating disaster risk.

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