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The *Dasa Wisma* of the Flood-Resilient Village Wonokusumo

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Abstract. **The aim of this activity is to motivate and increase society or community's understanding towards the disaster risk; develop society or community's capacity on responding certain disaster; enhance women empowerment in the disaster relief programs and activities on the local scale; and provide a contribution on empowering and developing DesTaNa/Desa Tangguh Bencana program (lit. Disaster-Resilient Village) in the flood-prone region of Wonokusumo district, Surabaya. The Dasa Wisma (ten neighboring families group, lit. Ten Houses) are trained to build and install biopori. The result of this activity is to expect the reduction of flood inundation areas during the rainy season so that the community can be freed from the flood.**

Keywords: Dasa Wisma, DesTaNa, biopori, Wonokusumo

INTRODUCTION

Wonokusumo is a subdistrict located within the Semampir district of Surabaya city and situated within a 6-kilometer distance to the city center. This subdistrict placed about 2 meters above the sea level and has a total land area of 162 hectares. The total population of this subdistrict is 61,198, thus making its density 80,524 people per kilometer square with one family approximately consists of five family members. The field observation shows that this subdistrict is densely populated with its windy and crowded alleys [1]. Wonokusumo also has some Islamic boarding schools, which is not a coincidence due to its religious neighborhood, proved by some Islamic sacred sites in the surroundings such as Sunan Ampel tomb and Sunan Giri and Sidogiri Islamic boarding schools. Related to water, people in this subdistrict claimed not to have any difficulties in accessing clean water because their houses are connected to the local water company or already have wells [2]. Despite the easy access to clean water, this subdistrict has difficulties in drainage, in which this subdistrict only has few insignificant size sewers, and some people sometimes have minimum awareness of the importance of healthy living and keeping the neighborhood healthy. It leads to many people dump their household waste on the sewer itself, which made the sewer blocked, hence causing flood during the rainy season [3].

This activity of community service (PPM) is conducted in the Dasa Wisma of Citizen Association (RW) 15, which covers three Neighbourhood Association (RT): RT 11, RT 21, and RT 22, in which each RT consists of 100 to 150 families. The site selection in the urban area is based on several considerations [4] such as (i) urban areas mainly have both high density and disaster risk index [5], in which the main threat is flooding; (ii) Surabaya has the high disaster risk index of 166.8; (iii) the subdistricts that potentially becomes a slum has its difficulties in its accessibility so its need strengthening on its community-based Disaster Risk Reduction (PRB) [6]; (iv) the distance between the location of community service and the campus is relatively close, so the campus can mobilize PPM team effectively and efficiently, so it also eases the observation and formulating efforts for the program's sustainability. Substantively, materials on this PPM activity refers to the main priority on SFDRR (Sendai Framework for Disaster Risk Reduction), which is understanding the disaster risk by strengthening capacity on urban communities with disaster risks of flooding and fire [7].

The strategic reason on the effort of increasing women involved in this activity to select Dasa Wisma [8] as its main target is that Dasa Wisma is already embedded in all of the local communities, so it is a strategic social capital; increasing women participation in disaster management; women proactively shape groups and social networks to fulfill people's needs, and as the result of their activity on disaster response, women also proceed in the natural resource and farming management in their neighborhood, which resulted in them automatically included as the workforce [9].

METHOD

This disaster management themed PPM activity, using the jargon of "empowering society for strength" principally based on three main pillars of social development and empowerment such as:

1. *Social participation*. This program is thoroughly designed as participative [10], to assist the society in ensuring the establishment of communities or groups in urban society in the fields of planning, executing, and observing the community-based disaster risk reduction program [11].

2. *Social organization*. The strengthening of the urban resilience capacity of affected people with flooding threat [12] becomes the priority of organizing the community-based disaster risk reduction program in selected subdistricts or cities from the participative risk studies or social mapping [11].
3. *Self-management and sustainability*. On the early step, the support of tools, infrastructures, systems [13], and network development is provided by FPT-PRB (Higher Education Forums for Disaster Risk Reduction), and afterward becomes self-managed and developed by and for the society by ensuring participation and/or involving communities in disaster management so that, in the long term, this program is expected to be sustainable [14].

Based on the community development principals mentioned above and the consideration that this FPT-PRB-supported PPM activity uses social empowerment patterns or schemes that combined with diaster management activity and/or disaster risk reduction [15], primarily related to the development and strengthening the urban resilience, then its steps and actions are not far from the general PPM implementation patterns, administratively. But, materials on disaster and disaster risk reduction that become the theme of this activity, which substantively has a dominant portion.

RESULT & DISCUSSION

From the mapping results and community meeting on the Strong Village Development, then there will be two planned activities/programs, such as (i) Field Rehearsal (flood rehearsal) and (ii) biopori installation. The description of those two programs are explained as follows:

A. Field Rehearsal (Flood)

Built infrastructure components are part of the fulfillment effort of the disaster risk reduction activity [16]. Other more essential elements are knowledge and understanding adequacy and the community's real action related to the disaster risk reduction with the function of its built residential neighborhood infrastructure [17]. The other effort besides the infrastructure components is the community's action. But, in the field, the adequacy, understanding, and real action level on disaster risk reduction have not well-balanced by building basic infrastructure. Considering the necessity of the adequacy of those levels, then it requires an activity to increase the knowledge adequacy, understanding level, and community's skills in facing disasters. One of the activity is to hold a simulation or field rehearsal on community-level in the village or urban subdistricts. Simulation, or field rehearsal, is an activity created as if it is real to test something. Disaster response simulation is a tool or an instrument to test knowledge, understanding, response, and community action level on pre-disaster, during a disaster, and post-disaster [18]

Furthermore, the purposes and objectives of this simulation, according to Khoiri [19], are as follows: (i) providing knowledge and understanding on disaster preparedness, either on the society level or the village/sub-district government level; (ii) encouraging the enhancement of social and governmental capacity in conducting anticipative measures in encountering disaster; (iii) providing skills to the society and village/sub-district government when facing disaster. Meanwhile, the objects or actors involved in this activity include (a) individuals and families in the designated area; (b) village/ sub-district government elements; (c) village/ sub-district/ citizen association/ neighborhood association residents; (d) women groups (Dasa Wisma); and (e) Regional Disaster Management Agency and other related agencies. The simulation is conducted by 500 people, with the focus on the residents previously severely affected by the disaster. This activity is attended by officials from district government, military area command, municipal police chief, and other Surabaya municipal agency heads that related to the flooding threat such as Public Works Board, Health Board, Education Board, and Transportation Board. Some communities also involved such as RAPI (Indonesian Citizen Radio), Indonesian Red Cross, Indonesian Scout, and CSR representatives of companies established around the sub-district.

B. Biopori Installation

Biopori is a cylindrical infiltration hole installed vertically into the ground as a water infiltration method to reduce flood puddle by enhancing water absorption. Furthermore, biopori is also interpreted as a hole or cavity in or on the ground shaped naturally or artificially. Naturally, it is shaped by plant's root movement or ground fauna, such as termites, ants, worms, et cetera [20]. Artificially, it is shaped by a certain tool by making an 80-100 cm deep hole with a diameter of 10-30 cm. Biopori hole making intends to become the infiltration medium for rainwater so the water can be absorbed to the ground faster. Moreover, the availability of biopori can enlarge the rainwater absorption of the ground, reducing puddles on the ground, and, in the end, reducing the water overflow volume towards the gutter or river [21]. Building artificial biopori is quite straightforward, either by manual or machine. Using manual tools may require tremendous effort. But using the machine can create biopori hole easier and faster. After the hole is shaped, the hole then filled with organic waste such as leaves or

food leftovers. Technically, biopori hole should be made with the size that already mentioned above (80-100 cm deep, 10-30 cm in diameter) [22]. For example, another biopori hole project conducted by the same team (PSBL Team of Unitomo) in Bungurasih village shows that the team did not use organic waste or compost due to odor pollution problems complained by the community as the previous project's evaluation. Furthermore, the replacement of the biopori medium (organic waste and compost) has to be often conducted, yet ended with a less effective result. Therefore, the biopori installation technique is conducted using the punctured pipe and filled with saltwater to penetrate soil pores. The installment of biopori is conducted in several places deemed as prone to become puddle during flooding. According to some residents' statements whose area is prone to flood, the biopori is quite effective in reducing puddle. In that activity, 15 bioporis are installed, which is a stimulant for Bungurasih village residents to multiply the biopori holes independently. This independent multiplication should work properly because there has been training from the PSBL Team of Unitomo towards the village volunteers and Dasa Wisma women on its installation techniques.

From the activity conducted, the members of the Family Welfare Empowerment group (PKK) on the subdistrict level and the Dasa Wisma group on the village/subdistrict level show enthusiasm and positively responds the effort of women involvement in the disaster management movement activity through the Dasa Wisma. Generally, the participants realize that the disasters in the last few years tend to happen in a sudden and frequently, which is adequate to support the self-evaluation and valuable lessons for their disaster risk reduction in their village/subdistrict. They also realize that disaster prevention and mitigation efforts are far more essential and useful than responsive efforts. The data collection activity is started by providing a training program towards women volunteers or women of the Dasa Wisma group of Wonokusumo subdistrict.

The implementation phases of the activity conducted in the Wonokusumo subdistrict are disaster simulations, socialization, and biopori installation, which attended by the community service team, Wonokusumo subdistrict resident, and Surabaya Regional Disaster Management Agency (BPBD). The implementation of this activity is synergized with the development program of Disaster Resilient Village (DestaNA), which one of the main programs of Surabaya's BPBD. This collaborative activity started with providing briefing/training to the society and government of the Wonokusumo subdistrict as many as 30 people for three days.

The basics of the implementation of this community service with the theme of Disaster and the Development of Disaster-Resilient Village are (i) mandate of Law No. 24/2007 about Community's Rights and Obligations (ii) emphasizing on the effort of building local community resilience, (iii) implementation of Community-Based Disaster Risk Reduction (CBDRM); and (iv) implementation of the mainstreaming of Disaster Risk Reduction [23]. Therefore, the effort on developing Disaster-Resilient Village intended on the independent effort of a village/subdistrict to adapt and face the disaster threat, and immediately recover from the disaster.

Moreover, the community/residents are encouraged to recognize disaster threats in their residence and able to organize community resources to reduce vulnerability and enhance the capacity to reduce disaster risk. The resilient village is a village that has the capacity and capability to adapt and face the potential threats until reached or preserved a function level and certain socio-culture structure on facing the mentioned threats [24]. This program also intends to encourage the establishment of resident's resilience in facing disaster, which is a community that can anticipate, reduce, and absorb the potentially destructive pressure or power through adaptation or resistance, manage or preserve certain essential and structural function during the disaster and recovering, revive, or bounce back after the disaster [25].

Besides the material delivery and discussion, this activity also shaped the Volunteer Group of Disaster-Resilient Village, consists of 20 people from the variety of social spectra such as Local Youth Organisation (Karang Taruna), Dasa Wisma, Mosque Youth Organisation (Remaja Masjid), local public figures, and the government officials of Wonokusumo district. Afterward, a social mapping activity [13] will be conducted to acknowledge the necessity of Wonokusumo subdistrict residence to encourage its community resilience in facing the flooding threat, which happens in this area almost annually with the duration of heavy rainfall as long as 2-3 days.

CONCLUSION

Dasa Wisma is able to understand the disaster risk, enhance social or community's capacity in facing the disaster, mainly during the disaster, enhance the women involvement in the disaster management program or activity on a local level, and contribute to strengthening or developing the Disaster Resilient Village (DesTaNa) program in the disaster-prone region in the Wonokusumo subdistrict of Surabaya city.

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