YAYASAN PLAN INTERNATIONAL INDONESIA

Affiliated with PLAN INTERNATIONAL

CASE STUDY

FLOOD EARLY WARNING SYSTEM DEVELOPMENT

A Case Study on the Effectiveness of Early Warning Tool and the Role of Young People on Flood Preparedness in Kelurahan Klender and Pinangsia, Jakarta

1. BACKGROUND

In the wee hours of January 1, 2020, floods hit many areas of Jakarta, Bogor, Tangerang and Bekasi. The high rainfall reached almost 38 cm which is more than three times the average amount of rain so far. The floods reportedly killed at least 48 people. Some parts of the city experienced power cuts for safety reasons. In some areas the water level reached 30 cm to 4 meters. More than 19,000 residents have been evacuated to safer places including state schools and buildings as temporary shelters. The loss was around IDR2 trillion. The specific economy activities including manufacturing and retail sectors decreased in transactions. The floods also affected environmental pollution and social problems. 201 schools were flooded, causing 8,420[1] children and young people to miss classes.

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2. INVOLVEMENT OF STAKEHOLDERS

Long before researchers carried out some researches[2] and studies[3] in order to manage floods in Greater Jakarta. Both the central and regional governments have already developed plan documents, spatial planning, master plans, and programs. However, many of them did not work well. Implementation of flood management plan is deemed partial, short-term, and not integrated yet. The government should be able to work with communities, private sectors, academics / universities, media, non-governmental organizations, and, if necessary, international communities. Communities have the local expertise and wisdom to their own surroundings. Being a part of the communities, young people have an important role to play. It is of strategic and great importance to encourage them engage in flood management. The Ministry of Youth and Sports stated that young people play roles as pioneers and volunteers to cooperatively build social solidarity and contribute to public safety[4].

[1] BNPB Report Kapusdatinmas BNPB, January 2020
[2] Review on Flood Management of Ciliwung River in DKI Jakarta from Perspective of Hydro-Economic Aspect (A Case Study of Cawang Section –Manggarai Floodgate). Heriantono Waluyadi, Rachmad Jayadi, Djoko Legono. 2007
[3] Ciliwung River Flood Analysis (A Case Study of Lenteng Agung-Manggarai Section). Restu Wigati, Wahyudin. 2013
[4] https://www.beritasatu.com/megapolitan/593530/kempora-konsolidasikan-relawan-pemuda-bantu-korban-banjir

3. FLOOD EARLY WARNING DEVICE

Jakarta Regional Disaster Management Agency (*Badan Penanggulangan Bencana Daerah* / BPBD) has a number of flood early warning devices[5] to provide information to the public. The Provincial Government of Jakarta has three types of early warning devices i.e., Disaster Warning System (DWS), Automatic Weather System (AWS) or weather gauge, and Automatic Water Level Recorder (AWLR) to measure water levels. Since 2015, Jakarta BPBD has installed eight units i.e., six units of Automatic Weather Station (AWS) and two units of High Tide Warning (HTW), in five municipalities and Kepulauan Seribu District[6]. It claimed that all of these devices functioned properly. The BPBD mentioned that they produced six more units in 2019 including the allocation of maintenance costs[7]. However, the communities reported that the device installed at RW (Community Unit) 03 Cipinang Melayu, East Jakarta in December 2019 did not function during the early January 2020 floods. The BPBD explained that the device got technical problems. Given this, the government and communities should pay more attention to the Standard Operating Procedures (SOP) for maintenance. They should make sure that the installed devices work during disaster times.

4. SUPPORTS OF PLAN INDONESIA

In collaboration with the Australian government and Plan Australia, Plan Indonesia has been supporting four villages (Kelurahans) of West Jakarta and East Jakarta through community resilience programs since 2015. To do this, Plan Indonesia engaged partner Yayasan Kausa Resiliensi Indonesia (YKRI), young people, and communities of the Kelurahans.

A disaster risk mapping conducted by the local young people found out that floods and fires are the two main disastrous threats in their areas. Every year, floods inundate these densely populated areas. They also affect people's living including that of young people and children, in economic, social, environmental and health aspects. Furthermore, some studies show that children are relatively more vulnerable to get injured or die in disastrous conditions[8]. Not only physically, disasters also affect young people psychologically more than the adults[9]. Young people are the assets of development, including in disaster management. Young Indonesians play very crucial roles in disaster risk management initiatives, given the title of Indonesia as a 'disaster laboratory'[10].

Based on these problems, YKRI and Plan Indonesia intensified capacity building through mentoring and networks to young people's innovative ideas. One of their successfully developed initiatives is creating a simple flood early warning tool. They made it from local materials, such as small plastic pipes, small-sized loudspeakers, cables, and tennis balls. They call it a 'rescue ball' as the tennis ball is the main component to be booster to sound an alarm. However, the source power for this equipment is still from electricity (AC) which is risky during floods.

Plan Indonesia and YKRI managed to facilitate young people to collaborate with the Agency for the Assessment and Application of Technology (Badan Pengkajian dan Penerapan Teknologi / BPPT). The collaboration improved the early warning device to be more comprehensive and durable. They use motorcycle battery as the power source and additional box to protect all

[5] https://news.detik.com/berita/d-4857857/begini-cara-bpbd-dki-sebar-peringatan-dini-banjir-ke-warga
[6] https://bpbd.jakarta.go.id/news/detail/931
[7] https://megapolitan.kompas.com/read/2020/01/16/22300981/dki-akan-tambah-6-alat-peringatan-dini-bencana-dipasang-di-lokasi-rawan?page=all
[8] Fothergill, 2017
[9] Norris, et al, 2002
[10] Surbakti and Yunus, 2013

components, a larger pvc pipes to protect the ropes, and additional alarm as well as indicator lights.

The collaboration led to the installation of the early warning tool in 2019 in Klender (watershed) and Kelurahan Pinangsia (drainage channel). Floods frequently occur in those areas every year in the densely populated areas. The people in the areas requested the device installation. The local people including young ones installed the devices at the lowest point area for both locations. They had been briefed before on the use and function of the device as well as on the actions to take when the alarm sounds.

On January 1, 2020 at 3 a.m., the flood early warning device in Klender sounded. The communities woke up and told other residents to evacuate. Similarly, in Pinangsia on January 24, 2020, the device warned that water had risen. The *Kelurahan* government instantly urged residents to take preparedness actions.

Quotes: "The flood early warning device is helpful for the surrounding communities, though they feel safe since the government has normalized the river. Moreover, young people must be able to recognize the potential disasters in their area," said Nabila, a resident of Klender.

"The existing early warning device is useful for the surrounding communities. They can maintain it well. I hope that no one would steal it," said Arum, a resident of Klender.

5. LESSON LEARNED

The Jakarta Provincial Disaster Management Strategic Plan, 2018-2022, states that to integrate the early warning system is one of the medium-term objectives. It is the main task of the provincial government in providing early warning services to the Jakarta people. Besides that, the community and young people also play an important role in preparedness, particularly in developing the system.

The young people successfully conducted innovation in developing a simple and inclusive

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device towards the city's resilience. They installed this device in flood-prone areas based on the community and their risk assessment and analysis as requested by the local Community Unit (RW). The installation and dissemination involved the local residents, so that people will not get panicked when the device sounds.

The involvement of all stakeholders in disaster risk reduction (DRR) especially early warning is an effort to synergize the implementation of disaster management. The youth-centered urban resilience framework could develop the flood warning device. This realizes the increased the youth engagement and empowerment in disaster preparedness efforts. This young people's simple work proved that government and other stakeholders can empower their engagement and participation. It is a good learning for the provincial government to integrate young people's rights into policies, particularly in disaster management and disaster risk reduction.

6. CHALLENGES

Based on data[11] on flood-prone areas in Jakarta, there are 566 flood-prone Community Units (RW) in Jakarta. This means many priority areas are in need of early warning devices to enhance the community flood preparedness. It is important to synchronize both devices made by the government and community so that information will not overlap.

Another challenge is limited allocation of DRR budget for disaster-prone areas in Jakarta. It is aimed more at the physical construction such as dykes, river normalization, and others, than other disaster risk variables such as community vulnerability. This vulnerability is even worsened by some construction projects.

[11] http://data.jakarta.go.id/dataset/daerahrawanbanjirdkijakarta

As a part of the communities, women, elderly people, children, and other vulnerable groups have the weakest control over access to public resources. So, their vulnerability to disasters goes to the high category.

In addition, it is the right of the community and young people to obtain information and skills on disaster management. Campaign and awareness among the people including young ones on DRR efforts are needed. The aspects include strong social institutions, adequate understanding of DRR, and other manageable social assets. This requires government programs which involve local initiatives and young people in the community.

7. CONCLUSION

The flood management and development and maintenance of early warning system should involve young people, communities, partner institutions, and the Kelurahan government. Young people need to have adequate knowledge and capacity to take necessary and sufficient actions before a disaster occurs[12].

Young people play a very important role in mobilizing peers, so that their involvement could usefully increase the resilience towards floods.

8. RECOMMENDATIONS

Based on the review of case studies in these two flood-prone areas of Jakarta, we propose the recommendations to the Provincial Government, both the executive and legislative, as well as to the public and other related stakeholders:

1. To provide program support and sufficient budget allocation. It will increase knowledge of young people and related stakeholders in strengthening data, information and disaster literacy, including preparation for or updating the inclusive disaster risk assessment documents, and developing communication, information and education programs on disasters. The involvement of young people will increase to work together and build trust within community and the government in anticipating for floods.
2. To support young people together with peers and local government to carry out preparedness actions. It should follow the Standard Operating Procedures (SOP) agreed for the early warning system, including observing and forwarding warnings to the community members for further evacuation and emergency response.
3. To develop community-based (and family-based) preparedness systems in flood-prone areas in Jakarta. This should consider local resources and knowledge of young people and their networks. The preparedness system should rely on scientific principles including restoration and protection of natural ecosystems and buffer zones to improve protection and risk reduction functions, and community environmental friendly livelihood functions.

[12] Wisner (2006) and Fothergill (2017)

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