Analysis of Factors Influencing the Community Health Cadres' Participation in Flood Disaster Risk Reduction in Indonesia

A Dissertation Submitted to the Cooperative Doctoral Program for Disaster Nursing of the Graduate School of Nursing in Partial Fulfillment of the Requirements for the Degree of
Doctor of Nursing

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University of Kochi
February 2020

Acknowledgement

First of all, I would like to thank almighty Allah, for his grace in accomplishing my doctoral program in Japan.

Further, I would like to express my deepest appreciation to my chief research advisor, Prof. Sakiko Kanbara, for encouraging my study and empowering me to grow as a disaster nursing global leader. Your advice on research and fieldwork have been invaluable.

I would also like to express my sincere gratitude to Prof. Maki Umeda, Prof. Misako Miyazaki, Prof. Yumi Tamura, and Assoc. Prof. Tomoko Komagata for serving as my vice research advisors even at hardship. Thank you for the guidance, advice, valuable comments, and suggestions on my research.

I owe my sincerest gratitude to the following people, without whom I would not have been able to complete this research, and made it through my Ph.D degree: Prof. Kimiko Nagasawa and Assoc. Prof. Yasuhiro Ishimine as my doctoral thesis external examiners, for letting my defense be a meaningful moment with valuable guidance and suggestions; Prof. Sayumi Nojima, Prof. Hiroko Minami, Prof. Yoko Nakayama, Prof. Ayami Nakano, Prof. Takahiro Ioroi, Prof. Sawa Fujita, Prof. Norimi Okawa, Prof. Satoru Yamada, Assoc. Prof. Mari Kinoshita, and Dr. Hyeon Ju Lee, for the meaningful guidance, support, and encouragement throughout the course of my graduate study at the University of Kochi.

I would like to express my thankfulness to all the Disaster Nursing Global Leader degree program (DNGL) staff. Also, I cannot forget to thank the staff belong to the University of Kochi, particularly Ms. Yukiko Nakaie, Ms. Kumiko Koga, Ms. Yoshiko Kono, Ms. Chiaki Takemasa, Mr. Akinori Harada, Ms. Itsumi Yamamoto, Ms. Mariko Hayashi, and Ms. Nami Ujihara, for the kindness and great assistance to me as an international student in the DNGL.

Thank all of my classmates in the DNGL for their kind assistance and the patience during my study in Japan. My gratitude to the DNGL students belong to the University of Kochi. Thank you, Ms. Megumi Nishigawa, for being an inspiring senior to the next global leaders of the disaster nursing. You have encouraged me and inspired confidence in me. Thank you very much, Ms. Mami Nojima, for being a great classmate in five years of study. You have saved me from having to ask so many embarrassing questions in class.

Best wishes for all your future endeavors. Thank you to Ms. Miho Murata, Mr. Kosuke Sasaki, Ms. Sushila Paudel, Mr. Yudi Ariesta Chandra, Ms. Yuko Fushimi, Ms. Sakiko Bando, Mr. Kazuyuki Sugimoto, and Ms. Michiru Masuta, for allowing me the space to not only have dialogue but also be creative within my assignments as well. Thank you also for the sharing, discussion, and feedback during rehearsals for my final defense and dissertation presentation. I also want to thank you to all of my Indonesian friends in Kochi, who shared with me all the happy and sad times in five years of study and for helping me through all the difficulties.

I am very grateful to the DNGL and the Japanese Government (MEXT scholarship) for providing me financial support during my graduate studies, and giving me opportunities to learn not only about local contexts but also global issues of disaster nursing.

I would like to thank the community of Semarang in Indonesia who took the time to return questionnaires and allowed me into their homes for follow up interviews and surveys, without whom I would have no content for my doctoral dissertation.

And finally, my biggest thanks goes to my mother and sister in Indonesia for all the support they have provided throughout this research, the culmination of five years of distance learning.

Abstract

Background: Coastal flooding, one of the frequent natural hazards in Indonesia, particularly in Semarang, includes sea level rises, tidal flooding, and land subsidence. Coastal flooding has a negative health impact on the communities living in these coastal areas. The government of Indonesia has initiated a community-based disaster risk management (CBDRM) approach as a strategy to reduce disaster risks by involving the member of a community, including health cadres, who are officially designated as health volunteers at the community level in Indonesia. They hold enormous potential for flood disaster risk reduction (DRR) such as in reducing public health risks, increasing disaster preparedness, and building trusting relationships among all stakeholders. Yet, it is challenging to apply the CBDRM approach involving health cadres from a grassroots level. The government expects the participation of health cadres as community assets for DRR. Nonetheless, health cadres must risk their own lives to save others in disaster situations. Involving health cadres, focusing on primary health care in the context of flood DRR, could be considered in this scheme.

Aim: This research aims to delineate influencing factors for health cadres' participation in flood DRR in Kemijen, Semarang, Indonesia.

Methods: A study design incorporating qualitative and quantitative methods was used in this research conducted from February to July 2019 in Kemijen. Face-to-face in-depth interviews were conducted with 22 participants (health cadres, supervisors of health cadres, the head of Puskesmas, and municipal health officers) to identify factors associated with the health cadres' participation in flood DRR. Inductive analysis was used to analyze qualitative data. Subsequently, a questionnaire was distributed to the 227 health cadres to examine which factors influenced health cadres' intentions to participate in flood DRR. Chi-square test, multiple logistic regression, and structural equation modeling (SEM) were used to analyze quantitative data. This study was approved by the ethics committee of the University of Kochi in Japan and the local governments of Indonesia.

Results: From the interviews, it was found that the participation of health cadres in flood DRR was likely to be related to *tugas* (a set of expectations to be carried out from encumbering the health cadres' position), existing support, perceived insufficiency of support, and the intentions of participation. The findings of the qualitative study were used to assess the potentiality of participation among the health cadres in flood DRR in Kemijen. Subsequently, the findings of quantitative study revealed that the intentions of participation in flood DRR were low among health cadres who: a) had an extended family (OR=0.25, p=0.04); b) obtained *tugas* for home visits (OR=0.21, p=0.01), and meetings with Puskesmas and health offices (OR=0.18, p=0.02); c) perceived insufficiency of

support such as direction and supervision (OR=0.52, *p*=0.03), insurance coverage (OR=0.64, *p*=0.02), and insufficient stipend (OR=0.57, *p*=0.04); and c) faced existing obstacles such as ineffective coordination and dispatching mechanism (OR=0.82, *p*=0.00), unreachable distance, takes cost and time (OR=0.37, *p*=0.04).

Conclusion: *Tugas*, existing support, perceived insufficiency of support, existing obstacles, and intentions of participation were the factors related to the health cadres' participation in flood DRR in Kemijen. *Tugas*, perceived insufficiency of support, and existing obstacles were the significant factors that influenced the intentions of health cadres to participate in flood DRR in Kemijen. *Tugas*, perceived insufficiency of support, and existing obstacles had a negative association with the intentions of participation in flood DRR among health cadres in Kemijen.

Keywords: participation, community, health cadres, flood, disaster risk reduction, Indonesia

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List of Abbreviations

BNPB	=	Indonesian National Disaster Management Authority (Indonesian: *Badan Nasional Penanggulangan Bencana*)
CBDRM	=	Community-Based Disaster Risk Management
CHVs	=	Community Health Volunteers
DHF	=	Dengue Hemorrhagic Fever (Indonesian: *Demam Berdarah*)
DRR	=	Disaster Risk Reduction
Health cadres	=	Community health volunteers in Indonesia (Indonesian: *Kader Kesehatan*)
IPCC	=	The Intergovernmental Panel on Climate Change
MoH	=	Ministry of Health
PHBS	=	Clean and Healthy Living Community Behavior (Indonesian: *Perilaku Hidup Bersih dan Sehat*)
Posyandu	=	Integrated Health Post (Indonesian: *Pos Pelayanan Terpadu*)
Puskesmas	=	Public Health Center (Indonesian: *Pusat Kesehatan Masyarakat*)
PKK	=	Indonesia National Women's Family Welfare Movement (Indonesian: *Pemberdayaan Kesejahteraan Keluarga*)
WHO	=	World Health Organizations

Chapter 1
Introduction

1.1. Background of Research

Many Asian countries have been experiencing floods as the most frequent environmental hazard, including Indonesia. As summarized by Dewi (2007), Indonesia is placed third in the list of most vulnerable countries to flood hazard in Asia, after China and India. Coastal flooding is one of the frequent natural hazards in Indonesia that occurs when the sea level rises to a critical height above the coastal lands due to tidal sea and sea surges (Harwitasari *et al*., 2011; Marfai *et al.*, 2008). The coastal line is a strategic area for various activities such as port facilities, recreation, fisheries, agriculture, industries, settlements, etc. Despite these advantages, coastal areas are vulnerable to changes caused by coastal activities. Residents living in coastal areas are also vulnerable because they rely on the natural resources of these coastal areas. The Intergovernmental Panel on Climate (IPCC) (2014) stated that the global sea level is expected to rise from at least 20 cm to 100 cm within the current century. Changes in sea level will adversely affect coastal communities by increasing the flood risk and/or coastal and cliff erosion, and that will also have ecological and economic impacts on valuable marine ecosystems (such as productive estuaries, coastal wetlands, and coral reefs). One of the cities located in a coastal area is Semarang.

On the other hand, the government states that efforts to reduce disaster risk have increasingly concentrated on Community-based Disaster Risk Management (CBDRM). CBDRM is an approach of promoting the participation of communities for disaster risk management at the local level (Indonesian Society for Disaster Management, 2011). The importance of local communities participating in DRR that they know their area and local situation best, and no outsider can understand the local opportunities and constraints as they do.

According to the Ministry of Health (MoH) of Republic of Indonesia (2011), health cadres are directly connected with community members and establish trusting relationships. Health cadres also serve as a liaison between community members and

health care providers. Health cadres may play an important role in flood DRR because of their potential effectiveness in reducing public health risks, increasing disaster preparedness, and building trusting relationships among all stakeholders. However, there are concerns about health cadres' intentions to participate in flood DRR. Health cadres may also become disaster survivors alongside caring for their families in disasters. Disaster volunteering is a choice one makes while sacrificing something else. Volunteers risk their own lives to save others but expect little in return (IFRC, 2011). Volunteers make it possible for humanitarian aid to access the vulnerable people (Indonesian Society for Disaster Management, 2011). Health cadres have the right to choose whether to participate in flood DRR, thus, we cannot force them.

Furthermore, previous studies (Arbon *et al.*, 2013; Balicer *et al.*, 2006; Chaffee, 2009; Connor, 2014; Ejeta *et al.*, 2015; Gowing *et al.*, 2017) found that there was more focus on capacity building to enhance the knowledge, attitude, and skills of health volunteers in emergencies and disasters. There is a limited body of literature that focuses on the intrinsic factors at the individual level and the extrinsic factors at the community and institutional level that influence health cadres to participate in DRR. Understanding the factors associated with intentions to participate in DRR would allow more effective planning for a disaster situation. Thus, research is necessary to delineate influencing factors for the participation of health cadres in flood DRR to optimize sustainable community healthcare during flooding in Indonesia.

1.2. Study Area

The study was carried out in Kemijen urban village, Semarang Timur subdistrict, Indonesia. Semarang is the capital of Central Java which is located on the north coast of Java Island. The topography of Semarang consists of two plains, the lowlands and coastal areas in the north; and the hilly areas in the south. In addition, the climate in Semarang is categorized as humid tropical with an average annual rainfall between 2,000 and 2,500 mm (ACCCRN, 2010), which peaks in December and January. The studies of Harwitasari *et al.* (2011), Marfai *et al.* (2008), and Resilient Semarang (2016) reported that the impact of floods has multiplied due

to sea-level rise, coastal erosion, and land subsidence in Kemijen. The immediate impact of flooding includes damage to property and deterioration of health conditions owing to waterborne diseases; it negatively affects drinking water, sanitation, access to healthcare, and safe food. The outbreak of water-borne and vector-borne diseases result from damage to the water and sanitation services (Resilient Semarang, 2016). In addition, the disasters not only brings injuries and deaths (WHO-SEARO, 2010) but also reduces access to basic healthcare. Since most of the inhabitants live in densely populated cities near the coast, the consequences become worse if flooding often occurs in such areas without any strategies to reduce health risks.

On other hand, health cadres in Semarang serve more than Posyandu (integrated health post at the village level), they are expected to perform broader roles and functions both on regular days and during flood disasters situations. The MoH of Republic of Indonesia (2011) mentioned that nationally, health cadres are expected to carry out their roles and functions as volunteers in all primary healthcare activities.

1.3. Research Questions

This research was conducted and divided into qualitative and quantitative studies. I formulated the first research question for the qualitative study.

1) What are the possible factors related to health cadres' participation in flood DRR in Kemijen?

Subsequently, I formulated the second and third research questions for the quantitative study.

2) What are the significant factors that influence health cadres' participation in flood DRR in Kemijen?
3) What are the association among factors of health cadres' participation in flood DRR in Kemijen?

1.4. Aim of Research

This research aims to delineate influencing factors for health cadres' participation in flood DRR in Kemijen.

Chapter 2
Literature Review

2.1. Public Health Impacts of Floods

Tidal flooding is coastal flooding caused by high tide (Marfai, 2004). The sea-water will inundate the land when high tide happens. Moreover, it will get worse when the highest high water level is reached. In Semarang, tidal floods are caused by a combination of a rise in sea levels and land subsidence. Land subsidence in Semarang is mainly caused by the extraction of underground water resources, the load of constructions, and the industrialization patterns on reclaimed land (Doornkamp, 1998). Moreover, in Semarang, an accelerated rise in sea level and land subsidence together results in a fast broadening of the flood-prone areas toward the outer coastal areas (Wibowo, 2006). According to Hinton (2000), tidal hazards in coastal areas are composed of three parts:

a) Tidal current, which causes sedimentation along the coast. The speed and direction of currents is important for sediment movement, erosion, deposition, and pollutant dispersal
b) Mixing of fresh and saline water when the extent of tides flows up rivers and other water-courses
c) Tidal inundation includes the height of water level, the extent of the tidal range, and the duration of inundation

Tidal floods impacts not only the social economy, but also the quality of health. Many diseases increase due to floods, such as leptospirosis and vector borne diseases. The floods impact the quality of drinking water which can be polluted. Flooding also infiltrates the sewage system, and consequently valves are fitted. Wastewater contains hazardous elements from domestic and industry harms people's health. If it overflows due to flood it may cause diseases (Kusnosaputro, 1985). According to Menne & Bertollini (2005), the impacts of flood on human health can be seen in Table 1.

Table 1. Impacts of flood on human health

Causes	Health Implications
Damage to water supply systems, sewage and sewage disposal damage, insufficient supply of drinking water, insufficient water supply for washing	Possible waterborne infections (e.g., endergonic *E. coli*, hepatitis A, dermatitis, etc.)
Rodent migration	Possible diseases caused by rodents (e.g., leptospirosis)
Disruption of social networks, loss of property, jobs and family members and friend	Possible psychosocial disturbances
Clean-up activities following floods	Injuries, lacerations, skin punctures
Destruction of primary food products	Food shortage, malnutrition
Damage to health services	Insufficient access to medical care

Source: Menne & Bertollini (2005)

2.2. Community-Based Disaster Risk Management (CBDRM)

Community-based Disaster Risk Management (CBDRM) is one of the important pillars in efforts in disaster risk management. Community-based disaster risk management (CBDRM) (UNDRR, 2019) is a process, which leads to a locally appropriate and locally "owned" strategy for disaster preparedness and risk reduction. For this, a series of efforts are required that include community self-interpretation of hazards and disaster risk, reduction and monitoring, and evaluation of their own performance in disaster risk reduction. However, the key to both are the optimal mobilization of resources that the community has and has control over and becoming an integral part of community daily lives (Paripurno, 2006). Understanding is important because grassroots communities living with hazards are not helpless people, as the technocrats would refer to them. Failure in such an understanding will lead to unsustainable disaster risk reduction at the grassroots level. If disaster risk reduction agendas do not come from the awareness of local community capacity and community priority, the effort will not be sustainable.

According to Sjöstedt & Sturegård (2015), the three pillars of CBDRM, the three core principles for a successful implementation of CBDRM, are sustainability, participation, and ownership.

1) Sustainability

Projects implemented in disaster-prone areas need to be sustainable. The ownership of the projects and their maintenance should belong to the community. NGOs or other agencies are often in charge of the projects, but if they are not properly implemented in the community, it is difficult to sustain when the project duration is over (Shaw, 2012a). The Ocho Rios paper states that CBDRM is about empowering communities by giving them the right to be in charge of their own resources and support services and not about creating projects at a community level. The switch in mind-set of supporting communities in their own projects, instead of pushing external projects onto the community, is vital (Maskrey, 2011).

2) Participation

Participation is one of the core principles of CBDRM and includes the involvement of different stakeholders at all levels (Shaw, 2012a). Without including the local level throughout the whole project, there is no sustainability, but when the community participates from the start, a continuous engagement and commitment is created due to an increased sense of responsibility and ownership. This demands cooperation between stakeholders in all stages of the project and is especially important in the risk and vulnerability assessment (Pandey & Okazaki, 2005). Maskrey (2011) states that if there is no true participation of the population but only support and funding towards building infrastructure and so forth, there will be no long-term maintenance, and therefore, no sustainability.

3) Ownership

The third pillar of CBDRM is ownership. It is commonly thought that it is the government and national authorities that are supposed to manage the preparations and aftermath of disasters, but considering the communities and individuals being the ones most affected, community ownership has to be implemented (Shaw, 2012). To achieve

any form of sustainability, communities have to be empowered and able to cope with the consequences of disasters (Pandey & Okazaki, 2005). A shift towards increasing the community's ownership by building the local capacity to handle projects is needed (Shaw *et al.*, 2012). By involving the citizens from the start of the project, the maintenance of it will increase, thus increasing sustainability (Maskrey, 2011).

The meaning of "community-based" in CBDRM can be extended as follows (Indosasters, 2007): full participation that involves the vulnerable, men and women, the elderly, people with special needs, the marginalized, and so on. It also means a bottom-up instead of top-down approach, full participation, access and control, inclusive approach, and a sense of ownership of the past, existing, and future systems of disaster management. A top-down approach may be possible initially, but over time, a community can be empowered to be self-reliant to ensure a more bottom-up approach.

The Indonesian National Disaster Management Authority (BNPB) was formed on 26 January 2008 along with the issuance of Presidential Regulation No. 8 of 2008 on the National Disaster Management Agency (Presidential Regulation No. 8/2008). The formation of the BNPB was mandated Law No. 24 of 2007 on Disaster Management (Law 24/2007), passed on 26 April 2007. In its five years (2008-2013), the BNPB has had a lot of achievements in providing protection to the public from the threat of disasters common in countries that are known to be prone to these disasters. Of course, in the process of disaster management, the BNPB cannot work alone, and working together with all parties concerned, including ministries/agencies at the national level, local governments at the provincial level, and districts/cities, civil society, the private sector, international institutions, and the community at the grassroots level. Although there are many shortcomings, the BNPB is seen to have managed to bring disaster management efforts into everyone's business and increased the sense of security from the risk of disaster.

Figure 1 shows the CBDRM as the pillar of disaster risk reduction in Indonesia. In the implementation of disaster management, there is also building the networking of stakeholders to reduce disaster risk. Although not specifically provided for in Law 24/2007, in practice, these networks are accommodated and executed with the forming of forums (platform) at the national, provincial, and district/city level, as well as thematic forums. At the national level, there is a National Platform for disaster risk reduction, a

multi-stakeholder forum participated by the government, civil society, the private sector, universities, media, and international agencies.

In the implementation of disaster management agendas, there is a very important role of the volunteer. Disaster management's volunteers are spearheading the implementation efforts in the field. It is a manifestation of the application of Law 24/2007, that the charge of disaster management is not the task of the government alone, but the private sectors, society, and others as well. The public can participate actively in disaster management, for instance, by being a disaster management volunteer at least once. Therefore, the development of the number and quality of volunteers is crucial; at this time, there are 30,320 recognized volunteers. As part of the efforts of disaster management in Indonesia, the role and management of volunteers has been denied by the Regulation by Head of National Disaster No. 17 of 2011 on Guidelines for Disaster Volunteers (Perka BNPB 17/2011).

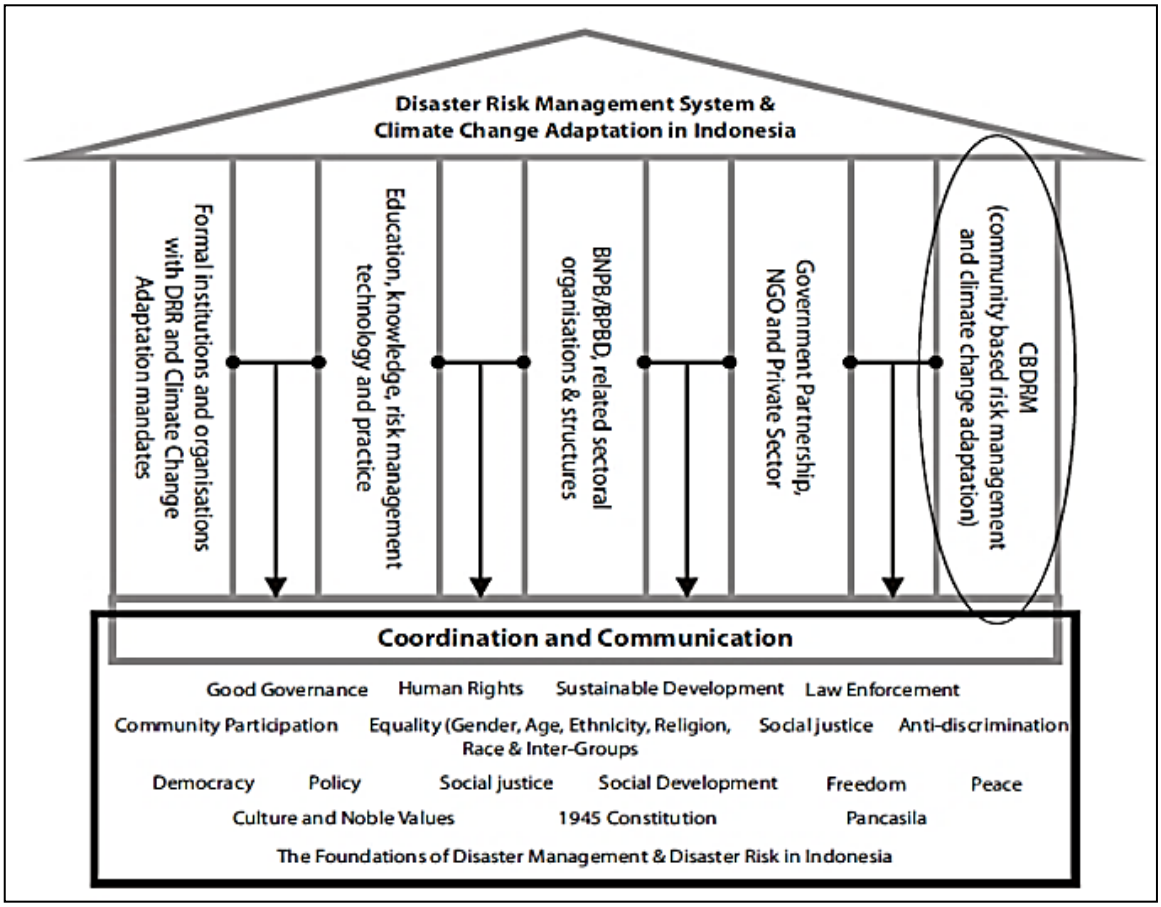

Figure 1. CBDRM, the pillar of disaster risk reduction in Indonesia (Indonesian Society for Disaster Management (MPBI), 2011)

2.3. Community Participation

According to Eliza & Tefurukwa (2018), community participation can be loosely defined as the involvement of people in a community in projects to solve their own problems. Community participation is one of the main principles of Primary Health Care (PHC), the strategy proposed in Alma Ata in 1978 by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) and adopted by 150 member states of the two organizations. It was meant to revolutionize the practice of health care and health development, leading to health for all by the year 2000 (WHO, 1978). Not that the concept was new; in the 1950s and early 1960s, it was used not only within health programs and health care; but also more broadly in social practice and development. Furthermore, community participation is promoted in global dialogue as a vital element of a human rights-based approach to health. This means not just ensuring the provision of health services and their use by the public but also tackling the underlying social determinants of health (Rifkin, 2014). Proven clinical and health service interventions could save numerous lives by 2030, if they were made available to all, but those people most in need of health care are often not reached (O'Connell & Sharkey, 2013; Requejo *et al*., 2014). Many factors – wealth, environment, gender, education, geography, culture, and other structural determinants – affect health outcomes directly through health services uptake, and indirectly via relationships and behaviors outside the clinic setting (Bohren *et al.*, 2014; Victora *et al.*, 2012). Community participation that is inclusive of underserved groups and is tailored to context is a fundamental principle of equitable primary healthcare as well as a way of optimizing interventions to improve health. Hence, community participation is important in DRR programs where people may be unaccustomed to their surroundings and in new concepts to reduce risks of health due to disasters.

However, people cannot be forced to participate in projects which affect their lives but should be given the opportunity where possible. This is held to be a basic human right and fundamental principle of democracy. Figure 2 shows that the participation of the people on issues that affect their daily activities matters. This can be effective only if there are skilled, dedicated, and committed bureaucrats; change in performance behaviors; steady and sufficient flow of revenues; effective council policy and regulations; and

creativity amongst stakeholders. All this would result in improving people's participation grounded at the grassroots.

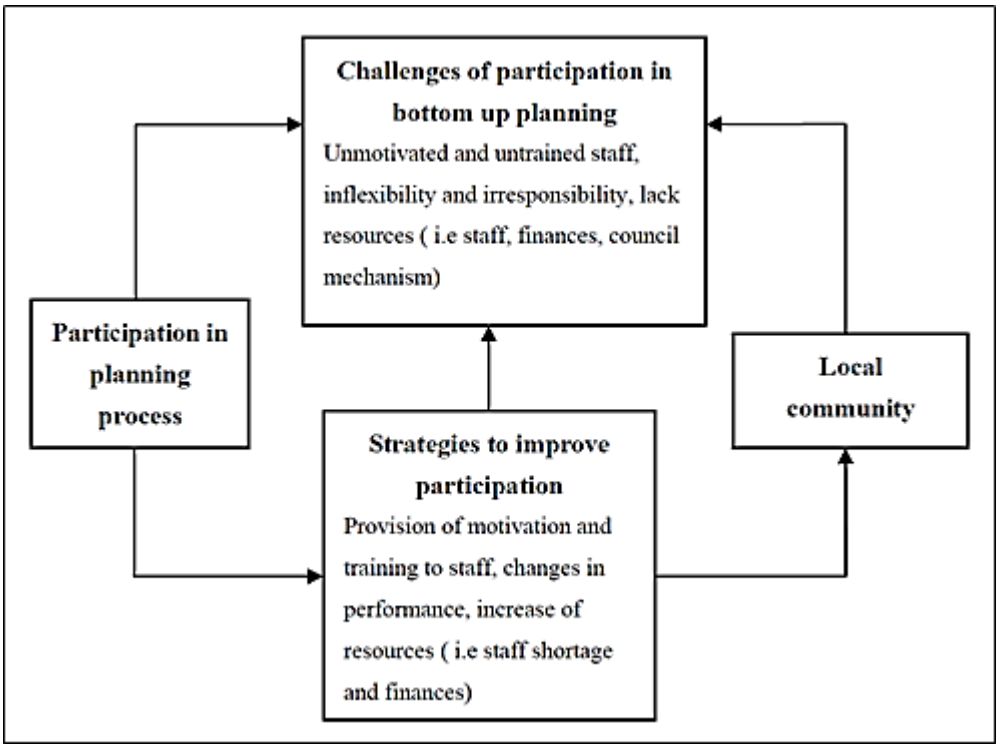

Figure 2. Conceptual framework for community participation
(Eliza & Tefurukwa, 2018)

2.4. Community Health Volunteers (CHVs)

In Indonesia, community health workers/volunteers (CHVs) are known as health cadres. Built on the national women's Family Welfare Movement (PKK) of the 1970s, volunteers called "health cadres" were trained to conduct health and nutrition promotion activities in every village. Health cadres are selected by their communities based on a set of characteristics, including educational achievement, how integrated they are within the community, personality, dedication to service, and willingness to commit to the time requirements. Health cadres are almost all women and are chosen by and from within the community to support services at the Posyandu. Health cadres receive one week of training and, over time, accumulate the skills and equipment necessary to carry out a set of tasks, including growth monitoring and promotion, treating common illnesses such as diarrhea, and preventing disease and malnutrition. The nearest sub-district Puskesmas provides technical guidance and support to health cadres' work. Health cadres undertake

"welfare work" for their community, and the monthly Posyandu sessions are seen as an important function and contribution to the welfare of the community.

Outside of the monthly Posyandu sessions, health cadres carry out follow-up visits in the community, attend community committee meetings, and update the Posyandu target and utilization data (MoH-Republic of Indonesia, 2011). Health cadres work about 8–10 hours monthly (Berman, 1992). The core activities carried out by health cadres and their Posyandu (MoH-Republic of Indonesia, 2011) are as follows:

a) Mother and child health care
b) Family planning
c) Immunization
d) Nutrition
e) Diarrhea prevention and treatment

Meanwhile, the optional additional activities (MoH-Republic of Indonesia, 2011) are as follows:

a) Empowerment of families with children younger than 5 years of age (*bina keluarga balita*)
b) Family herbal farm (*tanaman obat keluarga*)
c) Program for the elderly (*bina keluarga lansia*)
d) Pregnancy savings (encouraging women to save in preparation for delivery and the newborn's needs)

Health cadres provide voluntary service without financial compensation. Whether Health cadres ought to be volunteers supported in kind by the community or paid through community or government funds has been of much debate in the Indonesian health system. Much of the literature tends to imply that volunteers are the ideal to which most health cadres schemes aspire, and assumes that there is a sufficient pool of willingness to conduct voluntary social service in rural areas and informal settlements (Mander, not dated; Walt, 1988). However, health cadres may receive informal types of compensation, such as free medical treatment from higher levels in the health system (Berman, 1992). There is a high cultural value placed on doing something for one's neighbors, thus, volunteering as a health cadre is highly esteemed (Shelley *et al.*, 2014).

Health cadres also receive technical supervision from the staff at Puskesmas. Each Puskesmas has at least one general doctor alongside nurses and midwives. Someone from the Puskesmas staff visits each Posyandu session. However, the supervision of a health cadre is minimal. Health facility staff members who attend Posyandu sessions are not expected to supervise health cadres. Rather, they attend the Posyandu session as respected colleagues and they incorporate statistics of services provided at the Posyandu session as the first layer of data used in the district health information system (MoH-Republic of Indonesia, 2011).

2.5. Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) is an efficacious framework for investigating antecedents of behavior (Figure 3). A central factor in the TPB is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence behavior (Ajzen, 2002). Intentions are determined by three preceding motivational factors. The first is the attitude toward the behavior and refers to the degree to which the individual has a favorable or unfavorable evaluation of the behavior in question. The second predictor is a social factor termed subjective norm; it refers to the perceived social pressure to do or not to do the behavior. The third predictor of intention is the degree of perceived behavioral control which refers to the perceived ease or difficulty of performing the behavior. As a general rule, the more favorable the attitude and subjective norm toward a behavior, and the greater the perceived behavioral control, the stronger a person's intention to perform the behavior under consideration. Intention, in turn, is viewed as one direct antecedent of actual behavior. However, the level of success will depend not only on one's intention, but also on such partly non-motivational factors as availability of requisite opportunities and resources that represent people's actual control over the behavior (Ajzen, 2002). The relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention, and the relative importance of intention and perceived behavioral control in the prediction of behavior are expected to vary across behaviors and populations (Ajzen, 2002).

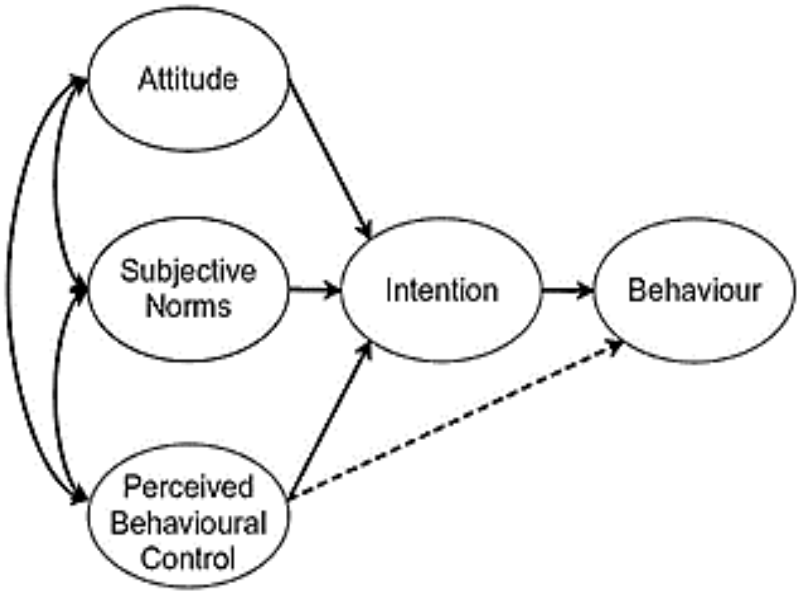

Figure 3. Theory of planned behavior (Ajzen, 2002)

These three factors, namely, attitude, subjective norms, and perceived behavioral control, lead to behavioral intention. In particular, the more favorable the attitude and the subjective norm, and the greater the perceived control, the stronger the person's intention to perform the behavior in question (Ajzen, 2002). Behavioral intention, in turn, is viewed as one direct antecedent of actual behavior. However, although there is general support for the TPB model, its adequacy to explain long-term planned behaviors, such as participating in disaster volunteer, has been questioned. Further, the level of success will depend not only on one's intention, but also on such partly non-motivational factors as availability of requisite opportunities, resources, and support that represent people's actual control over the behavior.

Chapter 3
Researches

This research was conducted and divided into the following: 1. Qualitative Study, and 2. Quantitative Study.

3.1. Qualitative Study

3.1.1. Objective

The qualitative study was conducted to identify factors possibly associated with the health cadres' participation in flood DRR in Kemijen, Semarang, Indonesia. In addition, the items in the questionnaire used were examined from the results.

3.1.2. Method

3.1.2.1. Target Population

The target research participants were health cadres, representatives of Puskesmas, and health officers from the division of health promotion and community empowerment program in Semarang.

3.1.2.2. Sampling

A purposive sampling method was used for selecting participants in this study. Purposive sampling, also known commonly as purposeful, judgmental, or selective sampling, is a non-probability sampling technique wherein the researcher consciously selects certain participants, elements, events, or incidents to include in the study (Grove, Burns & Gray, 2013). The purposive sampling method requires clear inclusion and exclusion criteria based on the research questions. The inclusion criteria of participants were as follows: a) were either male or female; b) had a good understanding about the public health care system policy and practice, the current problems of health promotion, and community empowerment programs in Semarang; and c) were knowledgeable about the customs and habits of local people. Meanwhile, the participants who refused to give informed consent, got sick at the time of data collection, and discontinued participation were excluded from the study.

Saunders *et al.* (2012) recommend between 5 and 25 informants for qualitative

research that uses non-probability sampling. The sampling continues until data saturation has been reached or no new analytical information is found (Hancock *et al.*, 2016).

The gatekeeper from the study area helped to recruit potential research participants based on the inclusion criteria. I then approached and contacted potential research participants recommended by the gatekeeper, to explain the study in an agreed-upon place. Potential participants were given 24 hours to decide whether to join this study or to decline. Health cadres who were interested in taking part in the study directly contacted the head of Puskesmas and the municipal health office, then, they were provided a package with an envelope containing several forms: `Request Letter for Participation in Research`, `Our Promises in Carrying Out the Research Study`, `Letter of Informed Consent`, and `Letters of Withdrawal`. The head of Puskesmas and the municipal health office asked and reminded the health cadres to express consent by signing the `Letter of Informed Consent`. Informed consent was obtained before conducting face-to-face in-depth interviews. After recruitment, the telephone numbers of all participants were taken to ensure contact and facilitate meetings during follow-up visits at an agreed-upon place in Kemijen to complete data collection during the follow-up period.

3.1.2.3. Data Collections

This research was carried out from February to May 2019 in Kemijen. In total, 22 participants including health cadres, supervisors of health cadres, the head of Puskesmas, and municipal health officers were included in the qualitative research. All participants had been informed and approved the utilization of an IC recorder during the interviews. Each interview lasted about 45–60 minutes. The scope of questions for the interview was about the participation of health cadres in flood DRR in the study area (Appendix 1: Interview guide). Sometimes it was difficult for participants to express their ideas or opinions through the Indonesian language. To solve this, we allowed them to answer questions through the Javanese language. I used memo writing and field notes for recording their insights to facilitate data analysis.

3.1.2.4. Data Analysis

All recorded data and detailed notes were transcribed and analyzed via inductive analysis. Units of analysis were extracted from the field observation and face-to-face in-depth interview texts, and were then condensed into one text typed in the NVivo 10 software. Important sentences, keywords, or phrases underlying factors of the health cadres' participation in flood DRR were highlighted. Common ideas in the text were sorted and coded based on their differences and similarities to develop themes of factors. After several modifications, the definitive themes finally emerged.

3.1.2.5. Ethics Approval

The study was carried out with approval from the institutional review board/ethics committees of both the University of Kochi in Japan (Reg No.: 18-60/Jan/22/2019) and the local governments in Semarang, Indonesia (Ref No.: 070/9309/04.5/2019). The confidentiality of data was assured. I did not report whether a participant was willing to participate or not as well as did not share what a participant was talking about with other people. Since we cooperated with the Sustainable Development Research Center of the Sultan Agung Islamic University (UNISSULA) as a counterpart in this research, the faculty members of UNISSULA were able to provide an adequate verbal explanation of the research and were able to handle participants if something happened to them.

3.1.3. Results

3.1.3.1. Demographic Characteristics of the Participants

Face-to-face in-depth interviews were conducted with 22 participants including health cadres (n=8), supervisors of the health cadres (n=6), the head of Puskesmas, and municipal health officers as managers of health cadres program (n=8). Participants were mostly university graduates aged between 33 and 46 years (Table 2). Further, five themes of factors for participation in flood DRR emerged from the interview data, namely: *tugas*, existing supports, perceived insufficiency of supports, existing obstacles, and intentions of participation in flood DRR (Appendix 2: Interview Transcript).

Table 2. Demographic characteristics of participants (n=22)

Participant Code	Gender	Age	Occupation	Education Level
Health Cadres (n=8)				
C-1	Female	45	Housewife	Senior High School
C-2	Female	45	Housewife	Senior High School
C-3	Female	35	Entrepreneur	Vocational/Training School
C-4	Female	38	Housewife	Junior High School
C-5	Female	34	Housewife	Senior High School
C-6	Female	43	Entrepreneur	Vocational/Training School
C-7	Female	44	Labor	Senior High School
C-8	Female	39	Housewife	Vocational/Training School
Supervisors of Health Cadres (n=6)				
S-1	Male	35	Nurse	Vocational/Training School
S-2	Female	42	Midwife	University
S-3	Male	39	Sanitarian	Vocational/Training School
S-4	Male	44	Sanitarian	Vocational/Training School
S-5	Male	37	Dietitians	University
S-6	Male	42	Nurse	University
Managers of Health Cadres Program (n=8)				
M-1	Male	42	Head of *Puskesmas*	University
M-2	Male	33	Municipal health officer	University
M-3	Male	46	Municipal health officer	Vocational/Training School
M-4	Male	40	Municipal health officer	Vocational/Training School
M-5	Male	40	Municipal health officer	University
M-6	Female	46	Municipal health officer	University
M-7	Male	40	Municipal health officer	University
M-8	Male	41	Municipal health officer	University

3.1.3.2. Themes of Factors of Participation in Flood DRR

3.1.3.2.1. *Tugas*

Tugas in the Indonesian language comes with multiple meanings that are role, function, task, and duty, which cannot be expressed in a single English term. *Tugas* of health cadres is expected by Puskesmas and health office.

According to the context of interview data and the phenomenon in the field, health cadres belong to Puskesmas and health offices who have incumbency, task, roles, and functions at the community level but voluntarily implement primary health care activities ordered by Puskesmas and health offices, namely: a) home visits, b) meetings with Puskesmas and health offices, c) clean and healthy living community behavior (PHBS) programs, d) transporting residents and mobilization, e) basic first aid for emergencies, f) provision of food nutrition, and g) eradication of mosquito (Appendix 2: Interview Transcript).

a) Home visits

The core of health cadres' routine work consists of visits to the households assigned to them. Supervisors of health cadres and health cadres reported that they visited each household together (interview, C-6). These visits may be conducted for referrals, data collection, health promotion and education, and so on. The visits also covered actionable recommendations to improve the household members' knowledge and behavior related to maternal and child health. The messages also included information on the prevention of dengue fever and diarrhea, more specifically, that proper handwashing and improved sanitation and hygiene can prevent diarrhea and draining the water tank every two weeks can reduce dengue fever cases.

b) Meetings with Puskesmas and health office

The supervisors of health cadres reported that nurses and midwives from Puskesmas conduct monthly meetings with health cadres that are held in each village (interview, S-1). This is intended to enable the health cadres to maintain their knowledge and skills to mobilize and empower households and community members for health action. During the monthly meetings, the Puskesmas' community health nurses and midwives discuss thematic areas with the health cadres based on their areas

of need as a way of promoting continuous community development activities program (interview, M-5).

c) Clean and healthy living community behavior (PHBS) programs

The municipal health officers reported that health cadres are assigned to behave and promote the Clean and Healthy Living Behavior (PHBS) program for reducing the incident rates of dengue fever in the community (interview, M-3). In addition, health cadres reported that they are expected to be able to deliver health education about PHBS programs and perform a simulation of washing hands using soap to the community (interview, C-2).

d) Transporting residents and mobilization

The supervisors of health cadres reported that when the referral Puskesmas were unable to treat a case, health cadres authorized by such Puskesmas will refer the patient to a hospital (interview, S-2).

e) Basic first aid for emergencies

The supervisors of health cadres reported that health cadres have been engaged in emergency response training in providing basic first aid and distributing hygiene kits (interview, S-1). With the first aid training, health cadres have also learned about the ways to treat minor injuries. However, there were cases where the health cadres felt able to provide some first aid (in relation to minor burns, wounds, and diarrhea), but for the most part, health cadres reported that this was not part of their role (interview, S-6).

f) Food nutrition

The municipal health officers reported that health cadres are working together in coordination with the nurses and midwives from Puskesmas (interview, M-6).

g) Eradication of mosquitos

Supervisors of health cadres and health officers mentioned that Kemijen urban village is a flood-prone area as well as a Dengue Hemorrhagic Fever (DHF) endemic

area (interview, M-8). Further, health cadre empowerment in dengue vector control is an attempt to encourage the community to participate in the prevention and control of DHF by monitoring and inspecting mosquito larva in the bathroom and water tank at each household (interview, M-1).

3.1.3.2.2. Existing Support

Existing support refers to perceived support from: a) family, relatives, and friends, b) community, c) Puskesmas, and d) health offices, that help health cadres work well (Appendix 2: Interview Transcript).

a) Perceived support from family, relatives, and friends

Health cadres perceived little support from their family, relatives, and friends because of the burden of duty which requires them to work in times of flooding (interview, C-5).

b) Perceived support from the community

Some health cadres perceived little support from all of the community members due to health cadres not being adequately trained to handle some primary healthcare services (interview, C-4).

c) Perceived support from Puskesmas

Health cadres received support from Puskesmas' nurses and midwives such as counseling and health examinations while health cadres organize Posyandu at the village (interview, C-2).

d) Perceived support from the health office

Health cadres reported good support from Puskesmas supervisory, but only occasional support from health officials (interview, C-6).

3.1.3.2.3. Perceived Insufficiency of Support

Perceived insufficiency of support refers to the kinds of support that health cadres wish to have to better perform their work in flood DRR, namely: a) directions

and supervision, b) insurance coverage, c) insufficient stipend, d) lack of logistic support and basic supplies in emergencies, and e) inadequate vehicle (Appendix 2: Interview Transcript).

a) Directions and supervision

The head of Puskesmas and the supervisors of health cadres mentioned that they are often overwhelmed by their own duties at Puskesmas (interview, M-1). Health cadres mentioned that they want to have adequate directions and supervision for their performances (interview, C-7).

b) Insurance coverage

Health cadres and their supervisors mentioned that health cadres do not have adequate insurance for their performance (interview, S-5). Health cadres may put themselves at risk of injury and even death in trying to rescue others in disaster sites (interview, C-5).

c) Insufficient stipend

In reality, most health cadres are in poor economic situations and require income. Health cadres mentioned that they perceived insufficiency of stipends for their performance in the community (interview, S-6; C-8).

d) Lack of logistic support and basic supplies in emergencies

Health cadres reported a lack of proper logistical support and basic supplies in emergencies to undertake their work (interview, C-3).

e) Inadequate vehicle

Health cadres reported that lack of means transport prevented them from obtaining needed supplies (interview, C-2).

3.1.3.2.4. Existing Obstacles

Existing obstacles refer to the limitation of health cadres' ability to do their work at community, namely: a) damaged roads, b) ineffective coordination and dispatching

mechanism, c) family responsibilities, and d) unreachable distance, and takes cost and time (Appendix 2: Interview Transcript).

a) Damaged roads

Health cadres and their supervisors reported that floods have damaged roads, and access to food and healthcare has been hampered (interview, C-5).

b) Ineffective coordination and dispatching mechanism

Health officers reported that health cadres do not know exactly what their job description is, what they are allowed to do, and what they are not allowed to do in terms of healthcare services, especially at times of floods (interview, M-5).

c) Family responsibilities

Health cadres reported that they face time constraints of household chores and get disapproval from husbands for health cadres' activities (interview, C-7).

d) Unreachable distance, and takes cost and time

Health cadres reported that long distances and geographic conditions prevented them from reaching Puskesmas as the field coordination unit center (interview, C-6).

3.1.3.2.5. Intentions of participation in flood DRR

Intentions of participation in flood DRR refers to values that support mutual respect and inclusive participation in the flood events including a) to help people, b) to reduce impact of diseases in community, c) to improve health and save live people in community, d) to fulfill responsibility as health cadre, and e) to build social networks (Appendix 2: Interview Transcript).

a) To help people

Health cadres told that they want to help community people and share their talents with others (interview, C-5).

b) To reduce the impact of diseases in the community

Health cadres told that they are willing to take a role as health cadres and do some voluntary activities such as blood pressure screening to reduce the impact of diseases in the community. In addition, they reported that they believe that God (Allah) will pay their good deeds later (interview, C-4).

c) To improve health and save live people in the community

The head of Puskesmas and the supervisors of health cadres reported that health cadres are able to improve health and save live people as well as to build relationships with communities through health cadres' activities at their own community (interview, M-6).

d) Role as health cadre

Health cadres reported that they are able to share knowledge they have with the community through health cadres' activities such as Clean and healthy Living Behavior (PHBS) when floods occur (interview, C-7).

e) To build social networks

Health cadres mentioned that they are able to build networks not only with community people at their own village but also with other people outside of the village through health cadres' activities (interview, C-2).

3.1.4. Discussion

In a qualitative study for the questionnaire development, a conceptualization was enhanced through the analysis of the phenomenon and context of health cadres' participation in flood DRR. The findings of qualitative study revealed the elements of participation in flood DRR at the individuals, community and institutional levels between health cadres and local health authorities (supervisors of health cadres and managers of health cadres program). The elements are expected *tugas* (interview guide: question #1 and #2), existing supports (interview guide: question #3, #4, #5, #6 and #7), perceived insufficiency of support (interview guide: question #6, #7 and #8), existing obstacles (interview guide: question #9, and intentions of participation in flood DRR (interview guide: question #3 and #4). I indicated what the questionnaire is measuring, which are

opinions, and recalled facts. There is a consensus in the literature that content validity is largely a matter of judgment (Mastaglia *et al.*, 2003) as content validity is not a property of the instrument, but of the instrument's interpretation. Therefore, the relevance of the scale's content was evaluated through expert assessment. *Tugas*, existing support, perceived insufficiency of support, existing obstacles, and intentions of participation in flood DRR were identified and defined as domains and latent variables in the quantitative study.

I generated 37 items for the questionnaire to examine the influencing factors for health cadres' participation in flood DRR and its associations among factors in Kemijen. Concerning questionnaire development, experts consisting of four health cadres, two supervisors of the health cadres, and three health officers were asked to provide comments and suggestions regarding the items' construction on the questionnaire (Appendix 3: Self-Administered Questionnaire). The evaluation focused on the clarity, ease of understanding, and length appropriateness of the overall questionnaire. It had been suggested that socioeconomic and demographic data should be added and included in the questionnaire. After the construction of the questionnaire items, I determined the format of the questionnaire. They agreed that scaling responses should be defined with a 4-point Likert-type scale based on an Indonesian context, except for factors of socioeconomic demographic data which were responded by potential participants using categorical type data. In addition, considering that a health cadre might have difficulty answering the monthly family incomes, nine reviewers suggested that the item of monthly family incomes be constructed in the form of alternative answers that refers to the Regencies Minimum Wage in Central Java 2019, namely: 1-Less than IDR 2,500,000; 2-IDR 2,500,000; and 3-More than IDR 2,500,000. Ultimately, as many as 37 items were developed for the questionnaire for the assessment of the health cadres' participation in flood DRR in Kemijen.

3.2. Quantitative Study

3.2.1. Objective

The quantitative study was conducted to examine the influencing factors for health cadres' participation in flood DRR and its associations among factors.

3.2.2. Method

3.2.2.1. Target Population

The target research participants were health cadres registered in Kemijen. According to the Municipal Health of Semarang Office (2018), there are approximately 270 registered health cadres in Kemijen.

3.2.2.2. Sampling

The total group of health cadres registered in Kemijen was chosen for this study. Participants who refused to give their informed consent, the exclusion criteria, got sick at the time of data collection, and discontinued participation were excluded from the study. From 270 sets of questionnaires I distributed to the health cadres through visiting homes, Posyandu activities at the village, Puskesmas, health offices, and village offices, as many as 240 sets of questionnaires were received. Only 230 health cadres completely filled all items of the questionnaire. Three of the respondents were excluded due to their condition, and one of them had a chronic physical illness and the other had moved outside of Semarang during the research period. Therefore, the responses of 227 respondents were analyzed in this research.

The gatekeeper from the study area helped to identify potential respondents based on the inclusion criteria. I then contacted potential health cadres to explain the study. Health cadres were given 24 hours to decide whether to join this study or to decline. I further contacted those who agreed to participate to make prior arrangements for the survey. Informed consent was obtained before conducting a survey. It included the name, telephone number, and work address of the researcher, and availability of professional help if health cadres were suffering from negative feelings.

Two hundred and thirty health cadres were recruited for the study. Two of the original respondents were excluded due to their condition. One of the respondents had a chronic physical illness. Therefore, data from 227 health cadres who answered all the items in the questionnaire were subjected to statistical analysis.

3.2.2.3. Data Collections

Self-administered questionnaires were conducted from May to July 2019. I coordinated with Puskesmas and community leaders to invite health cadres to gather at the village hall in Kemijen. I distributed the questionnaires to them there and in a meeting room provided by Puskesmas. As a follow-up, I also conducted a door-to-door survey and participated in Posyandu activities at the village to distribute questionnaires addressed to the health cadres who did not attend the village hall in Kemijen for an invitation letter. In reality, only female health cadres attended and agreed to participate in the survey.

I planned with supervisors of health cadres for proper accommodations. I gave participants a self-administered questionnaire which included the cover letter and informed consent. Then, I directed them toward a selected room in a private and quiet area where they were able to complete the questionnaire without interference. Prior to completing the questionnaire, I gave participants verbal instructions regarding their rights as participants. The entire process could be completed in approximately 45 minutes, including instructions and answering the questionnaires. Upon completion of the questionnaire, participants sealed them in provided envelopes and placed them in a secure and locked container located in the front of the room.

3.2.2.4. Data Analysis

Descriptive statistics, Chi-square test, and logistic regression were used to analyze data in this study. The primary focus of the study was to determine the association and its meaning between the intentions of participation in flood DRR as a dependent variable and age, family type, education level, occupation, monthly family incomes, and the domain of *tugas*, existing support, perceived insufficiency of support, existing obstacles as independent variables. The intentions of participation in flood DRR among health cadres in this study were categorized into two groups: yes or no. All statistical analyses were conducted using SPSS IBM version 23.

The differences in categorical variables were compared using Chi-square tests, and data were carried out by running frequencies and cross-tabulations. Futher, crude odds ratios (cOR) and adjusted odds ratios (aOR) with 95% confidence intervals (CI) were computed to estimate the strength of the association toward the intentions of participation in flood DRR using univariate and multivariate analyses. All variables with $p<0.25$ at

univariate analysis were included in the multiple logistic regression, and aOR were obtained after correction for possible confounders. The significance level was set at $p<0.05$ at multivariate analysis.

For data modelling, structural equation modeling (SEM) was run to analyze the structural relationship between measured variables and latent variables. For model fit, the Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Root-Mean-Squared Error of Approximation (RMSEA), and Chi-square statistics were generated. The cut-off point was 0.90 and above for GFI, AGFI, CFI (Hu & Bentler, 1999; Tabachnick & Fidell, 2007); 1–5 the acceptable range for CMIN/DF (Bollen & Stine, 1992); 0.07 and below for RMSEA (Steiger, 2007). A final model of health cadres' participation in flood DRR was constructed after the removal of non-significant constructs and mediation analysis. Circles represent latent variables and rectangles represent measured variables.

3.2.2.5. Ethics Approval

The study was carried out with approval from the institutional review board/ethics committees both at the University of Kochi in Japan (Reg No.: 18-60/Jan/22/2019) and the local governments in Semarang, Indonesia (Ref No.: 070/9309/04.5/2019). The confidentiality of data was assured. Respondents had the right to refrain from answering any questions in the surveys, or withdraw completely at once from participating without facing any penalty. They were asked not to use any identifiers that can link them to the surveys. They were made aware that data from the survey would be anonymous, and that no one will be able to connect them to the surveys. I cooperated with the Sustainable Development Research Center of the Sultan Agung Islamic University (UNISSULA) as a counterpart in this research, the faculty members of UNISSULA were able to provide an adequate verbal explanation of the research and were able to handle participants if something happened to respondents.

3.2.3. Results

3.2.3.1. Association between Socioeconomic Demographics and Intentions of Participation in Flood DRR

Table 3 indicated the association between socioeconomic demographic and the intentions of participation in flood DRR that was examined by a Chi-square test. Family type and occupation were significantly associated with the intentions of participation in flood DRR. As much as 44.5% of health cadres were of extended families and 85% of them were housewives in the ages of 35-55 years. The highest educational level attainment was senior high school.

Further, home visits, meetings with Puskesmas and health offices, transporting residents and mobilization, food nutrition, basic first aid for emergencies, and eradication of mosquitoes were significantly associated with the intentions of participation in flood DRR (Table 3). Health cadres rarely performed home visits and provided basic first aid for emergencies, and sometimes helped to transport and mobilize local patients to the health facilities. Meanwhile, health cadres always performed eradication of mosquitoes since Kemijen is in the DHF endemic area.

In addition, perceived support from family, relatives, and friends, perceived support from the community, and perceived support from health offices were also significantly associated with the intentions of participation in flood DRR (Table 2). Health cadres perceived good support from their family, community, people, and health offices.

Table 3 shows that health cadres perceived insufficiency of support for their performances. Directions and supervision, insurance coverage, insufficient stipend, lack of logistic support and basic supplies in emergencies, and inadequate vehicles were significantly associated with the intentions of participation in flood DRR.

Table 3 also shows that ineffective coordination and dispatching mechanisms, family responsibilities, unreachable distance, takes cost and time were significantly associated with the intentions of participation in flood DRR. Health cadres reported that ineffective coordination and dispatching mechanisms contributed to the limited intentions to be involved in flood DRR.

Table 3. Association with the intentions of participation in flood DRR (n=227)

Factors	Intentions of Participation in Flood DRR			(*p*)
	Yes (n (%))	**No (n (%))**	**Total (%)**	
Socioeconomic demographic				
Age				
Up to 34 years old	1 (0.5)	0 (0)	1 (0.5)	0.38
35-55 years old	173 (76.2)	20 (8.8)	193 (85)	
56 and more years old	32 (14)	1 (0.5)	33 (14.5)	
Gender				
Female	206 (90.7)	21 (9.3)	227 (100)	-
Marital status				-
Married	206 (90.7)	21 (9.3)	227 (100)	
Family type				
Nuclear Family	118 (52)	0 (0)	118 (52)	**0.00**
Single Parent	8 (3.5)	0 (0)	8 (3.5)	
Extended Family	80 (35.2)	21 (9.3)	101 (44.5)	
Education level				
Elementary School	22 (9.7)	0 (0)	22 (9.7)	0.25
Junior High School	25 (11)	3 (1.3)	28 (12.3)	
Senior High School	147 (64.8)	18 (7.9)	165 (72.7)	
Vocational School	12 (5.3)	0 (0)	12 (5.3)	
Occupation				
Housewife	167 (73.5)	21 (9.3)	188 (82.8)	**0.03**
Entrepreneur	24 (10.6)	0 (0)	24 (10.6)	
Labor	15 (6.6)	0 (0)	15 (6.6)	

Monthly family income				
Less than IDR 2,500,000;	121 (53.3)	13 (5.7)	134 (59)	0.12
IDR 2,500,000;	54 (23.8)	8 (3.5)	62 (27.3)	
More than IDR 2,500,000	31 (13.7)	0 (0)	31 (13.7)	
Tugas				
Home visits				
Rarely	111 (48.8)	21 (9.3)	132 (58.1)	**0.00**
Sometimes	69 (30.4)	0 (0)	69 (30.4)	
Always	26 (11.5)	0 (0)	26 (11.5)	
Meetings with *Puskesmas* and Health Office				
Rarely	80 (35.2)	21 (9.3)	101 (44.5)	**0.00**
Always	126 (55.5)	0 (0)	126 (55.5)	
Clean and Healthy Living Community Behavior (PHBS)				
Never	39 (17.2)	6 (2.6)	45 (19.8)	0.31
Rarely	66 (32.2)	8 (0.4)	74 (32.6)	
Sometimes	101 (44.5)	7 (3.1)	108 (47.6)	
Transporting residents and mobilization				
Never	3 (1.3)	15 (6.6)	18 (7.9)	
Rarely	77 (34)	6 (2.6)	83 (36.6)	**0.00**
Sometimes	98 (43.2)	0 (0)	98 (43.2)	
Always	28 (12.3)	0 (0)	28 (12.3)	
Food nutrition				
Rarely	80 (35.2)	21 (9.3)	101 (44.5)	**0.00**
Sometimes	51 (22.5)	0 (0)	51 (22.5)	
Always	75 (33)	0 (0)	75 (33)	

Basic first aid for emergencies				
Never	48 (21.1)	14 (6.2)	62 (27.3)	**0.00**
Rarely	100 (44)	7 (3.1)	107 (47.1)	
Sometimes	51 (22.5)	0 (0)	51 (22.5)	
Always	7 (3.1)	0 (0)	7 (3.1)	
Eradication of mosquito				
Never	3 (1.3)	0 (0)	3 (1.3)	**0.00**
Rarely	12 (5.3)	11 (4.8)	23 (10.1)	
Sometimes	76 (33.5)	10 (4.4)	86 (37.9)	
Always	115 (50.7)	0 (0)	115 (50.7)	
Existing Support				
Perceived support from family, relatives and friends				
Little support	65 (28.6)	18 (7.9)	83 (36.5)	**0.00**
Good support	92 (40.5)	3 (1.4)	95 (41.9)	
Best support	49 (21.6)	0 (0)	49 (21.6)	
Perceived support from community				
Little support	65 (28.6)	10 (4.5)	75 (33.1)	**0.02**
Good support	86 (37.9)	11 (4.8)	97 (42.7)	
Best support	55 (24.2)	0 (0)	55 (24.2)	
Perceived support from *Puskesmas*				
Little support	62 (27.3)	8 (3.5)	70 (30.8)	0.05
Good support	99 (43.6)	13 (5.8)	112 (49.4)	
Best support	45 (19.8)	0 (0)	45 (19.8)	

Perceived support from Health Office				
Not support	48 (21.1)	0 (0)	48 (21.1)	
Little support	29 (12.8)	19 (8.3)	48 (21.1)	**0.00**
Good support	120 (52.9)	2 (0.9)	122 (53.8)	
Best support	9 (4)	0 (0)	9 (4)	
Perceived Insufficiency of Support				
Directions and supervision				
Important	87 (38.3)	3 (1.3)	90 (39.6)	**0.01**
Very important	119 (52.4)	18 (8)	137 (60.4)	
Insurance coverage				
Little important	51 (7)	0 (0)	51 (7)	**0.00**
Important	128 (56.4)	4 (1.7)	132 (58.1)	
Very important	62 (27.3)	17 (7.6)	79 (34.9)	
Insufficient stipend				
Inappropriate	30 (13.2)	0 (0)	30 (13.2)	**0.02**
Appropriate	149 (65.6)	21 (9.3)	170 (74.9)	
Absolutely appropriate	27 (11.9)	0 (0)	27 (11.9)	
Lack of logistic support and basic supplies in emergency situations				
Absolutely inappropriate	39 (17.2)	0 (0)	39 (17.2)	
Inappropriate	35 (15.4)	0 (0)	35 (15.4)	**0.01**
Appropriate	84 (37)	21 (9.3)	105 (46.3)	
Absolutely appropriate	48 (21.1)	0 (0)	48 (21.1)	
Inadequate vehicle				
Inappropriate	17 (7.5)	0 (0)	17 (7.5)	**0.00**
Appropriate	163 (71.8)	13 (5.7)	176 (77.5)	
Absolutely appropriate	26 (11.5)	8 (3.5)	34 (15)	

Existing Obstacles				
Damaged roads				
Absolutely inappropriate	15 (6.6)	0 (0)	15 (6.6)	
Inappropriate	33 (14.5)	7 (3.1)	40 (17.6)	0.07
Appropriate	98 (43.2)	6 (2.6)	104 (45.8)	
Absolutely appropriate	60 (26.4)	8 (3.6)	68 (30)	
Ineffective coordination and dispatching mechanism				
Absolutely inappropriate	7 (3)	0 (0)	7 (3)	
Inappropriate	34 (15)	8 (3.5)	42 (18.5)	**0.00**
Appropriate	118 (52)	13 (5.7)	131 (57.7)	
Absolutely appropriate	47 (20.8)	0 (0)	47 (20.8)	
Family responsibilities				
Absolutely inappropriate	24 (10.6)	0 (0)	24 (10.6)	
Inappropriate	22 (9.7)	0 (0)	22 (9.7)	**0.02**
Appropriate	108 (47.6)	18 (7.9)	126 (55.5)	
Absolutely appropriate	52 (23)	3 (1.2)	55 (24.2)	
Unreachable distance, takes cost and time				
Absolutely inappropriate	21 (9.3)	0 (0)	21 (9.3)	
Inappropriate	22 (9.7)	8 (3.5)	30 (13.2)	**0.00**
Appropriate	122 (53.7)	13 (5.8)	135 (59.5)	
Absolutely appropriate	41 (18)	0 (0)	41 (18)	

Note: The results of the Chi-square test

Table 4 shows the results of univariate analyses and multivariate analyses for each of the components of socioeconomic demographic, *tugas*, existing support, perceived insufficiency of support, and existing obstacles toward the intention of participation in flood DRR. In the univariate analyses, the family type and occupation under consideration were associated with intentions of participation in flood DRR ($p<0.25$). After adjusting for the effect of other confounding variables in the multiple logistic regression, health cadres with extended family were likely 0.25 times decreased their intentions to participate in flood DRR (OR=0.25, $p=0.04$).

Furthermore, Table 4 shows that the *tugas* for home visiting, meetings with Puskesmas and health offices, transporting residents and mobilization, food nutrition, basic first aid for emergencies, and eradication of mosquitoes were associated with intentions of participation in flood DRR in the univariate analyses. After adjusting for the effect of other confounding variables in multivariate analyses, home visits (OR=0.21, $p=0.01$) and meetings with Puskesmas and health offices (OR=0.18, $p=0.02$) likely decreased the intentions of health cadres to participate in flood DRR.

With regard to perceived insufficiency of support in multivariate analyses, Table 4 shows that directions and supervision (OR=0.52, $p=0.03$), insurance coverage (OR=0.64, $p=0.02$), and insufficient stipend (OR=0.57, $p=0.04$) likely decreased the intentions of health cadres to participate in flood DRR.

In addition, Table 4 also shows that the existing obstacles faced by health cadres such as ineffective coordination and dispatching mechanism (OR=0.82, $p=0.00$), unreachable distance, takes cost and time (OR=0.37, $p=0.04$) likely decreased intentions of health cadres to participate in flood DRR.

Table 4. The results of logistic regression analysis. Factors influencing health cadres' participation in flood DRR (n=227)

Factors	Univariat Analysis		Multivariate Analysis	
	cOR	***(p)***	**aOR**	***(p)***
Age				
Up to 34 years old	1	-	-	-
35-55 years old	1.56	0.27	-	-
56 and more years old	1.22	0.26	-	-
Family type				
Single Parent	1	-	-	-
Nuclear Family	0.01	0.28	-	-
Extended Family	**0.52**	**0.03**	**0.25**	**0.04**
Education level				
Elementary School	2.31	0.28	-	-
Junior High School	2.33	0.28	-	-
Senior High School	2.42	0.29	-	-
Vocational School	2.55	0.28	-	-
Occupation				
Labor	0.11	0.16	1	-
Entrepreneur	0.12	0.15	0.11	0.09
Housewife	**0.24**	**0.01**	**0.55**	**0.03**
Monthly family incomes				
More than IDR 2,500,000	2.54	0.32	-	-
Up to IDR 2,500,000	2.70	0.28	-	-
Tugas				
Home visits	**0.22**	**0.01**	**0.21**	**0.01**
Meetings with Puskesmas and Health Office	**0.20**	**0.02**	**0.18**	**0.02**

Clean and Healthy Living Community Behavior (PHBS)	0.19	0.27	-	-
Transporting residents and mobilization	**0.26**	**0.04**	0.25	0.12
Food nutrition	**0.27**	**0.03**	0.23	0.11
Basic first aid for emergencies	**0.19**	**0.02**	0.15	0.09
Eradication of mosquito	**0.21**	**0.03**	0.19	0.07
Existing Support				
Perceived support from family, relatives and friends	**4.28**	**0.02**	4.44	0.06
Perceived support from community	**4.15**	**0.02**	4.74	0.08
Perceived support from Puskesmas	4.22	0.06	4.00	0.07
Perceived support from health office	**4.02**	**0.02**	3.97	0.07
Perceived Insufficiency of Support				
Directions and supervision	**0.45**	**0.03**	**0.52**	**0.03**
Insurance coverage	**0.78**	**0.01**	**0.64**	**0.02**
Insufficient stipend	**0.78**	**0.02**	**0.57**	**0.04**
Lack of logistic support and basic supplies in emergency situations	**0.40**	**0.03**	0.12	0.06
Inadequate vehicle	**0.46**	**0.03**	0.33	0.12
Existing Obstacles				
Damaged roads	0.67	0.32	-	-
Ineffective coordination and dispatching mechanism	**0.81**	**0.00**	**0.82**	**0.00**
Family responsibilities	**0.23**	**0.03**	0.61	0.08
Unreachable distance, takes cost and time	**0.55**	**0.04**	**0.37**	**0.04**

Note: Variables with p<0.25 at univariate analysis were included for multivariate analysis.
Levels of significance were set at p<0.05 at multivariate analysis;
cOR = crude Odds Ratio; aOR= adjusted Odds Ratio.

Table 5 shows the Cronbach's Alpha value and indicates that *tugas* (0.801), existing support (0.784), perceived insufficiency of support (0.747), existing obstacles (0.876), and intentions of participation in flood DRR (0.812) exceed the acceptable value of 0.70 (Nunnaly and Bernstein, 2004). Thus, the results of internal consistency for all items in the questionnaire were acceptable.

Table 5. Internal consistency of a questionnaire (n=227)

Domain	**Cronbach Alpha**
Tugas	0.801
Existing support	0.784
Perceived insufficiency of support	0.747
Existing obstacles	0.876
Intention of participation in flood DRR	0.812

Figure 4 shows a conceptual model with multiple logistic regression analysis. This research also included a survey about socioeconomic demographic data of health cadres. The findings revealed that family type and occupation were factors significantly associated with the intentions of health cadres to participate in flood DRR. Health cadres who are housewives and living with parents, their children, aunts, uncles, grandparents, and cousins in the same household have multiple roles in managing their own domestic matters. Health cadres may also become disaster survivors alongside caring for their families in disasters. It suggests that authorities should consider the socioeconomic status of health cadres with respect to their expanding *tugas* in responding to disasters alongside their social and own family responsibilities.

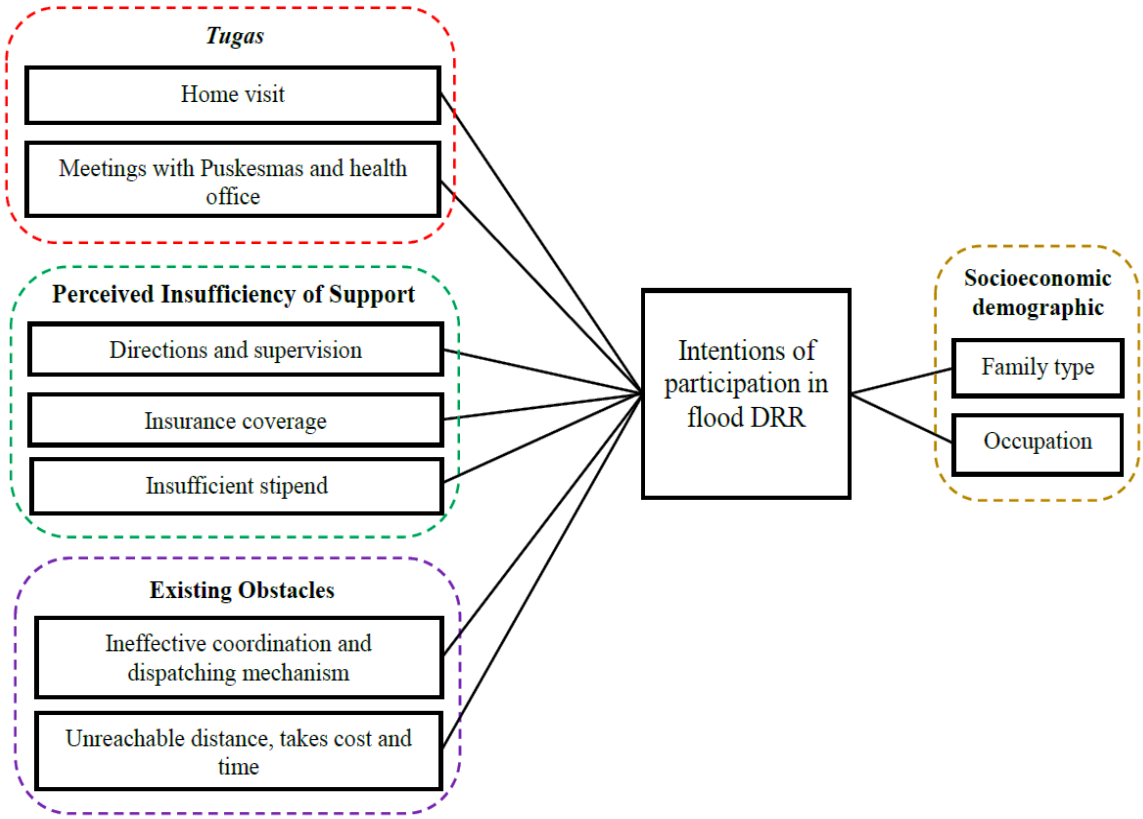

Figure 4. Associated factors with the intentions of health cadres to participate in flood DRR

Based on the findings of multivariat analysis, the final model with structural equation modeling (SEM) results was conducted to depict the relationship among factors (Figure 5). The final sample size was 227. The GFI=0.97, AGFI=0.96, CFI=0.98 , RMSEA=0.06 , and CMIN/DF=1.89. Those values indicate a good fit between the model and the observed data. Assuming that the intentions of health cadres to participate in flood DRR was influenced by a complex incorporation of the factors that comprise *tugas* (e.g., home visiting, meetings with Puskesmas and health office), perceived insufficiency of support (e.g., direction and supervision, insurance coverage, insufficient stipend), and existing obstacles (e.g., ineffective coordination and dispatching mechanism, unreachable distance, takes cost and time). The findings of this research illuminated a number of key support needs for health cadres, challenges they faced, and factors associated with their intentions to participate in flood DRR. Intentions of participation in flood DRR among health cadres has not effectively translated into volunteering actions. The workloads of

tugas may demotivate health cadres to participate in emergency volunteering. Inappropriate institutional environments may also impose serious barriers, decreasing the intentions of health cadres to participate in flood DRR and their contribution to volunteering services. Future efforts should be made to convert volunteering intentions into effective contributions to the emergency response system. This can be done through improving the organized efforts of health cadres by implementing policies, regulations, coordination mechanisms, and health cadres training and support.

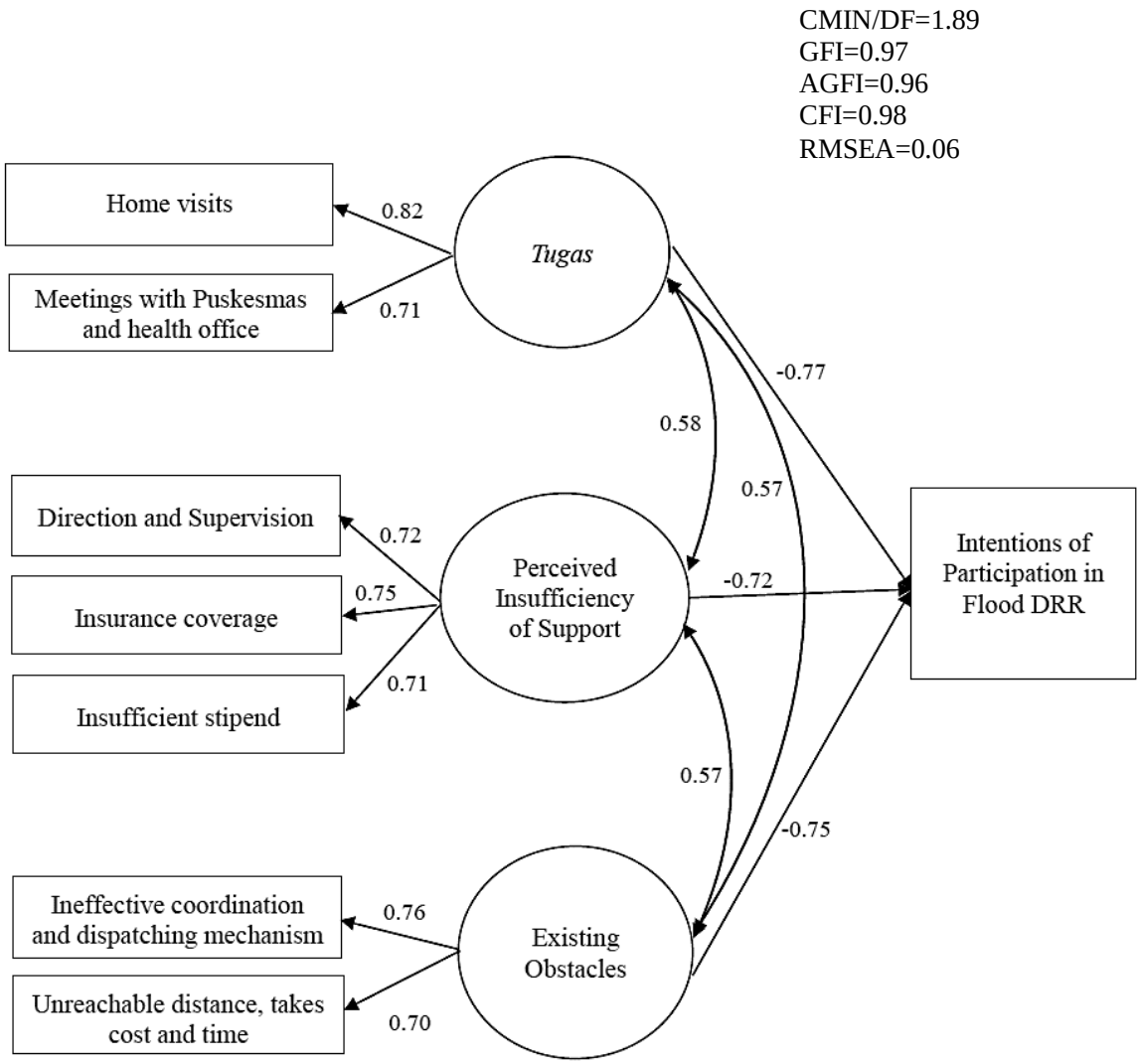

Figure 5. Final model with structural equation modeling (SEM) results

Chapter 4
Discussion of Research

The results of this research illuminated several key support needs for health cadres, challenges they faced, and factors associated with their intentions to participate in flood DRR.

4.1. Factors Possibly Related to the Health Cadres' Participation in Flood DRR

Disaster arises as a result of the hazard and the vulnerability of actors facing potential risks. Efforts to reduce disaster risk have increasingly concentrated on community-based actions focusing on reducing vulnerability and increasing resilience to disasters. The importance of communities to participate in DRR is that local communities know their own village and local situation best and that no outsider can understand the local opportunities and constraints as they do.

In Indonesia, health cadres are directly connecting with community members and establishing trusting relationships. Health cadres also serve as a liaison between community members and health care providers. Health cadres may play an important role in flood DRR because of their potential effectiveness in reducing public health risks, increasing disaster preparedness, and building trusting relationships among all stakeholders. However, there are concerns about their intentions to participate in flood DRR. Most health cadres are female, non-health professionals, the first responders at the community who may also become disaster survivors alongside caring for their families in disasters. Disaster volunteering is a choice one makes in the sacrifice of doing something else. Volunteers risk their own lives to save others but expect little in return (IFRC, 2011). Volunteers make it possible for humanitarian aid to access the vulnerable people (Indonesian Society for Disaster Management, 2011). If health cadres are working for humanity, the authorities should protect them socially and economically. Health cadres have the right to participate or not participate in flood DRR, thus, we cannot force them.

In addition, health cadres are usually outside the formal health system, although they may receive support from it to discharge their functions. Their backgrounds are diverse. Some have formal education, while others are housewives, laborers, entrepreneurs,

community leaders, and members of civil society organizations. Then, health cadres could be defined as lay-persons of varied backgrounds, coming from, or based in the communities they serve, who have received brief training on a health problem they have volunteered to engage with. It is important to develop trust and harmony between the government, local community, and the health cadres, especially in relation to improving health cadres' participation in flood DRR program. Sufficient organizational support and appropriate relations with an organization could motivate health cadres to fulfill their *tugas* for primary healthcare within the context of DRR. We should reduce barriers to motivation by designing effective health cadres' job descriptions, and we should create systems that allow health cadres to meet their own needs.

Coordination from related stakeholders is required to support the health cadres' participation in the flood DRR program. The main stakeholders are the Puskesmas and local governments. There is a need to encourage health cadres to perform effectively and sustainably. Health cadres, as one of the main executors of the primary healthcare program at the community level, need the Puskesmas to work accordingly. To achieve sustainability, some components need to be considered such as information, operational support, and policy support from the local governments. The support is expected to improve the health cadres' capacity to resolve health-related problems in the surrounding society within the DRR context.

Environmental context such as long travel distances and geographic conditions prevented health cadres from obtaining drugs and other needed supplies from Puskesmas as the coordination unit center. Occasionally they are forced to use their own money to hire transport services. The cost of travel and replenishment of the supplies, material, and equipment are important determinants of their performance that should be taken into consideration. It also becomes a dire situation when health cadres with low monthly incomes are challenged with availability and high cost of transport when implementing their *tugas*.

Health cadres choose to participate in flood DRR for a variety of reasons. Health cadres feel it is important to help others or to participate in their community. They are motivated by a desire to give back to the community, to use their skills, and to meet with like-minded people. For some, it offers the chance to give something back to the community or make a difference to the people around them. For others, it provides an

opportunity to develop new skills, to strengthen social relationships, and to address personal value and enhance self-esteem as a health cadre. The intentions of health cadres to participate in flood DRR has an expressive function for the individual, which can so express the values that drive their existence.

Health cadres are the most common form of community participation in the primary healthcare sector in Indonesia. Community participation has a crucial role in the health sector in Indonesia, particularly in flood-prone Kemijen. This widespread consensus on the importance of community participation has been followed by years of argument about what it meant and how best to create sustainable community participation, particularly community participation within the context of DRR. Appropriate incorporation of these factors (e.g., *tugas*, existing support, perceived insufficiency of support, existing obstacles, and intentions of participation in flood DRR) among health cadres may improve the participation of health cadres in flood DRR to be more secure and safe and effectively.

4.1.1. *Tugas*

Health cadres implemented home visits, meetings with Puskesmas and health office, clean and healthy living community behavior (PHBS) programs, transporting and mobilizing residents, providing food nutrition, basic first aid for emergencies, and eradicating mosquitoes in the study area. Since Kemijen urban village is a flood-prone area and is a Dengue Hemorrhagic Fever (DHF) endemic area, thus, health cadres empowerment in dengue vector control is an attempt to encourage the community to participate in the prevention and control of DHF.

Tugas was associated with the intentions of health cadres to participate in flood DRR (Table 4). Health cadres, whose duties encompass a wide range of service delivery tasks, tend to have the heaviest workload in terms of the number of tasks they are asked to perform. The core of health cadres' routine work consists of visits to the households that have been assigned to them monthly. These visits may involve referrals, data collection, health promotion and education, and so on. The visits also covered actionable recommendations to improve the household members’ knowledge and behavior related to maternal and child health. CHWs can “perform better with clearly defined roles and a limited series of specific tasks than if they are expected to undertake broader tasks or have

an ill-defined role" (Haines *et al.*, 2007). Programs must carefully assess and monitor the workload of health cadres and the effect on health cadres' motivation.

4.1.2. Existing support

Some health cadres faced challenges in the field. They perceived little support from their family, relatives, and friends because of the burden of duty which requires them to work in times of flooding. Moreover, some health cadres perceived little support from all of the community members due to health cadres not being adequately trained to handle some primary healthcare services. Training and education is perhaps the most commonly used strategy for improving knowledge and awareness. Evidence shows that education is the most consistent and strongest determinant of volunteering participation (Lee *et al.*, 2008). A study from another country has also shown that with proper training and supervision, CHWs/CHVs could be trusted to undertake community case management of malaria in communities in sub-Saharan Africa (Harvey *et al.*, 2008).

4.1.3. Perceived insufficiency of support

Health cadres also mentioned that they wished to have directions and supervision for their performances. Health cadres who do not have adequate supervision can be a risk to the community and make them less effective. A study in Ghana found that while child mortality improved with community health nurses, it slightly worsened in areas with only CHVs (Pence *et al.*, 2007).

Further, health cadres who do not have insurance can be a risk in flood DRR. Health cadres risk their own lives to save others but expect little in return. We must all work together to protect, promote, and recognize each and every one of health cadres. It suggests ensuring their safety as effective strategies to enhance their retention rate in the mission. Motivating the volunteers and retaining their dignity and ensuring their health and security should be included in health for DRR plan.

Moreover, a lack of financial compensation for services rendered would lead to an inability of community volunteers to provide for their family and is particularly exacerbated in areas of pervasive poverty. Skar *et al.* (2016) investigated the influence of incentive mechanisms on emergency volunteering and found that the desire for advancement opportunities and better pay is a strong reason for providing emergency

volunteer services. The willingness to become a volunteer could be influenced by the wish to earn an income or the hope of being compensated eventually, especially in situations where there is high unemployment or fewer job opportunities (Mukherjee and Eustache, 2007; Nsabagasani *et al*., 2007; Ozawa, 2010; Schneider *et al.*, 2008). However, in Indonesia, the incumbent health cadres are designed to rely on volunteerism as an unpaid care worker while maintaining measurable health impact (MoH-Republic of Indonesia, 2011). We should reduce barriers to motivation by designing effective health cadres job descriptions, and we should create appropriate systems that allow health cadres to meet their own needs.

4.1.4. Existing obstacles

Health cadres reported that ineffective coordination and dispatching mechanism contributed to the limited intentions to be involved in flood DRR. Hierarchical structures and vertical programs within the health system hamper communication among health cadres, other health personnel, and management, and among NGOs that employ health cadres, negatively affecting health cadres' participation in flood DRR. There is a lack of coordination between the sectors involved in disaster management in Indonesia, and it seems that a comprehensive plan with the participation of relevant organizations such as the ministry of health, Indonesian Red Cross, and the National/Local Agency for Disaster Countermeasure (BNPB/BPBD) is needed. Health cadres, like other community volunteers, must be considered. Drill exercises may offer a platform for the better coordination of unorganized volunteers (Nesbit & Brudney, 2013).

In addition, environmental barriers such as long travel distances led to difficulties for health cadres to access the assembly point to their assigned places for obtaining drugs and other needed supplies. Occasionally they are forced to use their own money to hire a motor "becak" or taxi motor services. The cost of travel and replenishment of the supplies, material, and equipment are important determinants of their performance that should be taken into consideration. It also becomes a dire situation when health cadres with low monthly incomes are challenged with availability and high costs of transport when implementing their *tugas*.

4.1.5. Intentions of participation in flood DRR

The intentions of health cadres to be involved in flood DRR has an expressive function for the individual, which can express the values that drive their existence. Health cadres are directly connecting with community members and establishing trusting relationships and a recognition of shared interests. Health cadres also serve as a liaison between community members and healthcare providers. Although many health cadres face threats to their dignity, they appreciate the purpose and value of their work and are motivated to improve health and serve their communities. According to WHO (2015), sustainable measures to build partnerships between health workers and to provide essential supplies and allowances have the potential to increase motivation, promote dignity, and increase the health impact of community health cadres. This is a people-centered approach to the health system that is purposefully engaging each individual's perspective and agency.

4.2. Significant factors that influenced the health cadres to participate in flood DRR

Findings indicated that *tugas* was the most significant factor influenced the intention of health cadres to be involved in flood DRR. The participation of health cadres in society organizations means contributing time and/or expenses, and an individual's economic status may thus affect his or her level of participation.

However, there are concerns about their intentions to participate in flood DRR among health cadres. Health cadres may also become disaster survivors alongside caring for their families in disasters. Disaster volunteering is a choice one makes in the sacrifice of doing something else. Volunteers risk their own lives to save others but expect little in return (IFRC, 2011). Volunteers make it possible for humanitarian aid to access the vulnerable people (Indonesian Society for Disaster Management, 2011). Health cadres have the right to choose whether to participate in flood DRR, thus, we cannot force them.

Evaluations have reported that CHWs often become overwhelmed by a very broader tasks with negative effects on the overall quality of their performance (Hermann *et al.*, 2009). Clearly defined roles, standardized protocols, and job aids should ensure that health cadres practice within the limits of what they can achieve and for which they have been trained. Programs must avoid over-burdening CHWs with competing priorities and

expanding interventions of various initiatives (Haines *et al.*, 2007) without making concessions in other aspects of their work environment.

4.3. Association among factors of health cadres' participation in flood DRR

The construction of the path model of health cadres' participation in flood DRR revealed that *tugas*, perceived insufficiency of support, and existing obstacles have a direct influence on the intentions of health cadres to participate in flood DRR.

The direct influence of perceived insufficiency of support towards intentions to participate in flood DRR had a negative association. For every unit increase in perceived insufficiency of support, the intention of health cadres to participate in flood DRR lowered. A study in Ghana found that while child mortality improved with community health nurses, it slightly worsened in areas with only CHVs (Pence *et al.*, 2007). Health cadres who do not have adequate supervision can be a risk to the community and make them less effective. Some studies referred to giving motivation to volunteers (Ferreira *et al.*, 2012; Finkelstein *et al.*, 2008) and ensuring their safety as effective strategies to enhance their retention rate in this mission (Bjerneld *et al.*, 2006; Pafford, 2013). Motivating the volunteers, retaining their dignity, and ensuring their health and security should be included in the plan.

The direct influence of existing obstacles towards the intentions of health cadres to participate in flood DRR had a negative association. For every unit increase in existing obstacles, the intention of health cadres to participate in flood DRR lowered. There is a lack of coordination between the sectors involved in disaster management in Indonesia, and it seems that a comprehensive plan with the participation of relevant organizations such as the ministry of health, Indonesian Red Cross and the National/Local Agency for Disaster Countermeasure (BNPB/BPBD) is needed. Certain characteristics of vertical programs, such as clear objectives, work schedules, and frequent supervision, are assumed to facilitate involvement and performance (Oliveira-Cruz, Kurowski, & Mills, 2003). However, the existence of multiple vertical programs could also lead to confusion at the community level as a result of an unclear division of *tugas* of the different types of CHVs involved in these programs and to dissatisfaction at the CHVs level, because of differences in policies regarding incentives and career advancement. In Indonesia, the health system is run through a hierarchal approach where all policy decisions, goods, and

funds are directed from the ministry of health at the national level to all primary health centers through health offices in regional and district areas (WHO-Indonesia Country Profile, 2003). As a result, health services became compartmentalized, lacked coordination, and required more resources. Consequently, multiple vertical programs could negatively influence health cadres' participation in flood DRR. Health cadres, like other community volunteers, must be considered.

4.4. Limitation of the research

I realize that I cannot generalize the results due to the study design employed. My study is a cross-sectional study that does not allow causal conclusions to be drawn. I started with a cross-sectional study to first establish whether there were associations among current variables. For this purpose, a longitudinal study design needs to be employed by future studies to determine cause and effect in the study area over time. Moreover, the qualitative study does not allow the measurement of the examined problems. Participants were aware of the background of the researcher as a male nurse, and this may have influenced their responses. Human error is also a possibility while conducting inductive analysis as there is a risk for researchers to misinterpret the data gathered.

In addition, the concept of community health cadres' participation in flood DRR adopted in this study was general and covered a broad range of events including public health emergencies and social unrest. This may lead to uncertain answers or responses from some participants.

Further, the gender aspect is a critical and sensitive issue in DRR. No male health cadres participated in the survey. Future research is necessary to address the willingness of male volunteers groups for emergencies and disasters in another study area in Indonesia and compare it thereafter with female health cadres groups.

Chapter 5
Conclusion of Research

5.1. Conclusion

The participation of health cadres in flood DRR is likely to be related to *tugas*, existing support, perceived insufficiency of support, and intentions of participation. The findings of the qualitative study generated 37 items for the questionnaire to examine the influencing factors for health cadres' participation in flood DRR and its associations among factors in Kemijen.

I conclude this research by answering the three research questions.

1. *Tugas*, existing support, perceived insufficiency of support, existing obstacles, and intentions of participation are the factors related to the health cadres' participation in flood DRR in Kemijen.
2. *Tugas*, perceived insufficiency of support, and existing obstacles are the significant factors that influence the intentions of health cadres to participate in flood DRR in Kemijen.
3. *Tugas*, existing obstacles, and perceived insufficiency of support had a negative association with the intentions of participation in flood DRR.

5.2. Significance of the research

1. The findings of this study can contribute as a strategy for the policy makers and local institutional actors (NGOs, NPOs) to optimize sustainable community healthcare for flood DRR performed by health cadres in Indonesia and Japan. This may improve the regulations and systems of community-based disaster volunteers organized by local authorities for better health outcomes in the community.
2. This study presents a conceptual model of community health cadres' participation in flood DRR for nursing academia and researchers to develop further DRR programs in building community resilience.

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Appendix 1: Interview Guide

English version

1. Please explain the roles and functions of the Puskesmas or health office in the DRR efforts in your area.
2. a) Does the Puskesmas or health office involve health cadres in the emergency situations/DRR efforts?
   b) If yes, please briefly explain how the Puskesmas or health office involves health cadres in the emergency situations/DRR efforts?
   c) Give me some examples of health cadres' participation in your area.
   d) Can you provide a copy of the policy or regulation on flood DRR?
3. Could you specifically explain how health cadres decide to participate in emergency situations/flood DRR with Puskesmas or health office?
4. a) Are you satisfied with the health cadres' participation?
   b) Please explain why or why not satisfied?
5. If the Puskesmas or health office does not involve health cadres, why do you think your institution has not required health cadres?
6. How does Puskesmas or health office select, supervise, empower, and retain the health cadres for the emergency situations/flood DRR?
7. What are the necessary supports to involve health cadres actively for the emergency situations/flood DRR?
8. How is the program financed to ensure the participation of health cadres for the emergency situations/ flood DRR in your area?
9. a) What challenges the Puskesmas or health office faced when your community areas affected by flooding?
   b) What challenges health cadres faced to participate in the emergency situations/flood DRR?

Thank you for your time and cooperation

Indonesian language version

1. Tolong jelaskan tugas Puskesmas atau kantor kesehatan dalam upaya PRB di daerah Anda.
2. a) Apakah Puskesmas atau dinas kesehatan melibatkan kader kesehatan dalam situasi darurat/upaya PRB?
   b) Jika ya, tolong jelaskan secara singkat bagaimana Puskesmas atau dinas kesehatan melibatkan kader kesehatan dalam situasi darurat/upaya PRB?
   c) Berikan saya beberapa contoh partisipasi kader kesehatan di daerah Anda.
   d) Bisakah Anda memberikan salinan kebijakan atau peraturan tentang PRB banjir?
3. Bisakah Anda secara khusus menjelaskan bagaimana kader kesehatan memutuskan untuk berpartisipasi dalam situasi darurat/banjir dengan Puskesmas atau dinas kesehatan?
4. a) Apakah Anda puas dengan partisipasi kader kesehatan?
   b) Tolong jelaskan mengapa atau mengapa tidak puas?
5. Jika Puskesmas atau dinas kesehatan tidak melibatkan kader kesehatan, menurut Anda mengapa institusi Anda tidak membutuhkan kader kesehatan?
6. Bagaimana Puskesmas atau dinas kesehatan memilih, mengawasi, memberdayakan, dan mempertahankan kader kesehatan untuk situasi darurat/banjir?
7. Apa dukungan yang diperlukan untuk melibatkan kader kesehatan secara aktif untuk situasi darurat/banjir?
8. Bagaimana pendanaan program untuk memastikan partisipasi kader kesehatan dalam situasi darurat/banjir di daerah Anda?
9. a) Apa tantangan yang dihadapi Puskesmas atau dinas kesehatan ketika daerah komunitas Anda terkena dampak banjir?
   b) Apa tantangan yang dihadapi kader kesehatan untuk berpartisipasi dalam situasi darurat/banjir?

Terima kasih atas waktu dan kerjasama Anda

Appendix 2: Interview Transcript

Table 1. Result of interview transcript in English translation

Theme of Factor 1: *Tugas*
a) Home visits “We together with the personnel of Puskesmas Karangdoro visit home to assess a mother's pregnancy condition and perform monitoring on inspecting mosquito larva in the bathroom at each household” (C-6).
b) Meetings with Puskesmas and health office “We conduct meetings with health cadres once a month at our hall” (S-1). “We share the importance of information from the health office and about PHBS, nutrition, etc. We have meetings every month to evaluate the activities of previous months and plan activities of the current month” (M-5).
c) Clean and healthy living community behavior (PHBS) programs “We hope health cadres could routinely conduct Posyandu together with Clean and Healthy Living Community Behavior (PHBS) in villages” (M-3). “We (health cadres) try to conduct PHBS once a month but the problem, in some areas we only are able to conduct it once every 2 months because the area is hard to reach” (C-2).
d) Transporting residents and mobilization “They (health cadres) rely on a motorbike, taxi motor, or motor becak in their community to transport patients to the nearest 24 hours Puskesmas even they carry patients during rainy days and floods” (S-2).
e) Basic first aid for emergencies "We are also trained by PMI and/or NGOs to respond safely, responsibly, and effectively to emergency situations for our communities such as diarrhea, fever or injured” (C-1). “Health cadres will assess the situation, if they are still able to take care of the patient then they will treat the patient there. If they could not treat it, then they have to send the patient to the nearest 24 hours Puskesmas or hospital" (S-6).
f) Food nutrition "Health cadres also distribute Vitamin A and deworming at Posyandu because many children get suffering diarrhea and dehydration at the village" (M-6).
g) Eradication of mosquito "Kemijen includes Dengue Hemorrhagic Fever (DHF) endemic because this area is a flood-prone area and is an area often affected by high tides. Health cadres’ empowerment in dengue vector control is an attempt to encourage the community to participate in the prevention and control of dengue" (M-8).
Theme of Factor 2: Existing Support
a) Perceived support from family, relatives and friends “We perceived little support from my husband because of the workloads of health cadres tasks in the time of flooding” (C-5).

b) Perceived support from community
"Some of us perceived not much support from community members due to mistrust. Perhaps they do not trust us because we (health cadres) are not adequately trained persons to handle some primary healthcare services" (C-4).

c) Perceived support from Puskesmas
"Puskesmas personnel provide counseling or examination while we (health cadres) carry out registration, weighing and other measurements during Posyandu" (C-2).

d) Perceived support from the health office
"We sometimes sent complaints to the health office about our obstacles we faced in the village. But, they just gave some warning to the staff. Yeah, that is all. It often occurs" (C-6).

Theme of Factor 3: Perceived Insufficiency of Support

a) Directions and supervision
"We felt that Puskesmas personnel were often overwhelmed by the task and suggested the community leader be included to support in some areas" (M-1).

"We need to receive some directions and supervision for our works from Puskesmas" (C-7).

b) Insurance coverage
"Emergency rescue is risky, and health cadres don't have any injury insurance coverage" (S-4).

"All of us should be insured against accidents according to the activities of flood risk reduction and its capacity to cover such insurance" (C-2).

"If we are working for humanity, the Puskesmas and health office should protect us socially and economically" (C-3).

"If I participate in flood DRR, I'm not sure if there is an agency that would provide me with life protection. We need to have it for our works" (C-6).

c) Insufficient stipend
"Health cadres generally are given a few remuneration" (S-6).

"There is a lack of incentives for health cadres activities in routine days, even during floods" (C-8).

d) Lack of logistic and basic supplies in emergency situations
"We have some of the health equipment here, but all is now expired or some are missing" (C-3).

e) Inadequate vehicle
"I don't have an adequate vehicle to a camp medical supplies place" (C-2).

Theme of Factor 4: Existing Obstacles

a) Damaged roads
"There were times that it was flooding and it was at night and we were not able to reach the given place since damaged roads and we do not have adequate vehicles. It was hard" (C-5).

b) Ineffective coordination and dispatching mechanism
"Because of a lack of effective coordination, health cadres often fail to play their role in emergency rescue efforts" (M-5).

c) Family responsibilities “I am a widow and have children. So when I am called for action day, I don't have time due to my busy work. I have to sell fish and assist my husband’s work to get family income because that is what I use to feed the family and pay rent rather than going to a job without payment” (C-7).
d) Unreachable distance, and takes cost and time “When flood occurred, we could not come because of long distances and unreachable access to the field coordination unit center” (C-6).
Theme of Factor 5: Intentions of Participation in Flood DRR
a) To help people “I was becoming a health cadre because I truly like helping people, I feel called to be a health cadre and share my talents and time with others" (C-5).
b) To reduce impact of diseases in community “We are willing to take on additional roles, such as blood pressure screening, registration, weighing and other measurements at the community level. Our motto is we do some good deeds and Allah will pay us later” (C-4).
c) To improve health and save live people in community “Health cadres work with patients in both settings to help them appraise the options available to them. They are able to take the time to build relationships with patients and truly assist them with decision making. Because of this, patients were able to become more self-aware and find solutions to their needs" (M-6).
d) Role as health cadre "We are able to use our knowledge to provide information to patients about Clean and Healthy Living Community Behavior (PHBS) when floods occur” (C-7).
e) To build social networks “...because it often lets me get closer to a community, the people and the region. I enjoy meeting different people from different backgrounds and cultures while performing as a health cadre" (C-2).

Table 2. Result of interview transcript in Indonesian language

Tema Faktor 1: Tugas
a) Kunjungan rumah “Kami bersama-sama dengan personil Puskesmas Karangdoro mengunjungi rumah untuk menilai kondisi kehamilan seorang ibu dan melakukan pemantauan pada pemeriksaan jentik nyamuk di kamar mandi di setiap rumah tangga” (C-6).
b) Pertemuan bersama petugas Puskesmas dan dinas kesehatan “Kami melakukan pertemuan dengan kader kesehatan sebulan sekali di aula kami” (S-1). “Kami berbagi pentingnya informasi dari dinas kesehatan dan tentang PHBS, nutrisi, dll. Kami mengadakan pertemuan setiap bulan untuk mengevaluasi kegiatan bulan sebelumnya dan merencanakan kegiatan bulan ini” (M-5).
c) Program Perilaku Hidup Bersih dan Sehat (PHBS) “Kami berharap kader kesehatan dapat secara rutin melakukan Posyandu dengan program Perilaku Hidup Bersih dan Sehat (PHBS) di desa-desa” (M-3). “Kami (kader kesehatan) mencoba melakukan PHBS sebulan sekali tetapi masalahnya, di beberapa daerah kami hanya mampu melakukannya setiap 2 bulan sekali karena daerah itu sulit dijangkau” (C-2).
d) Mengangkut penduduk dan mobilisasi “Mereka (kader kesehatan) mengandalkan sepeda motor, ojek, atau becak motor di komunitas mereka untuk mengangkut pasien ke Puskesmas 24 jam terdekat bahkan mereka membawa pasien ketika hujan dan banjir” (S-2).
e) Pertolongan pertama pada keadaan darurat "Kami juga dilatih oleh PMI dan / atau LSM untuk merespons secara aman, bertanggung jawab, dan efektif terhadap situasi darurat untuk masyarakat kami seperti diare, demam atau cedera" (C-1). “Kader kesehatan akan menilai situasi, jika mereka masih bisa menangani pasien maka mereka akan menangani pasien di sana. Jika mereka tidak dapat mengatasinya, maka mereka harus mengirim pasien ke Puskesmas 24 jam atau rumah sakit terdekat "(S-6).
f) Gizi makanan "Kader kesehatan juga mendistribusikan Vitamin A dan obat cacing di Posyandu karena banyak anak menderita diare dan dehidrasi di desa" (M-6).
g) Pemberantasan nyamuk "Kemijen termasuk daerah endemik Demam Berdarah Dengue (DBD) karena daerah ini merupakan daerah rawan banjir dan sering terkena banjir rob. Pemberdayaan kader kesehatan dalam pengendalian vektor demam berdarah merupakan upaya mendorong masyarakat untuk ikut serta dalam pencegahan dan kontrol demam berdarah "(M-8).
Tema Faktor 2: Dukungan yang Ada
a) Dukungan yang dirasakan dari keluarga, kerabat, dan teman “Kami merasakan sedikit dukungan dari suami saya karena beban kerja tugas kader kesehatan pada saat banjir” (C-5).
b) Dukungan yang dirasakan dari masyarakat “Beberapa dari kami merasa tidak banyak dukungan dari anggota masyarakat karena ketidakpercayaan. Mungkin mereka tidak mempercayai kami karena kami (kader kesehatan)

bukan orang yang cukup terlatih untuk menangani beberapa layanan kesehatan primer ”(C-4).

c) Dukungan yang dirasakan dari Puskesmas

“Petugas Puskesmas memberikan konseling atau pemeriksaan sementara kami (kader kesehatan) melakukan registrasi, penimbangan dan pengukuran lainnya selama Posyandu” (C-2).

d) Dukungan yang dirasakan dari dinas kesehatan

“Kami terkadang mengirim keluhan ke dinas kesehatan tentang kendala yang kami hadapi di desa. Tapi, mereka hanya memberi peringatan kepada staf. Ya, itu saja. Ini sering terjadi ”(C-6).

Tema Faktor 3: Persepsi Ketidakcukupan Dukungan

a) Arahan dan pengawasan

“Kami merasa bahwa petugas Puskesmas sering kewalahan oleh pekerjaannya dan menyarankan agar kepala desa dimasukkan untuk mendukung di beberapa daerah” (M-1).

“Kita perlu menerima beberapa arahan dan pengawasan untuk pekerjaan kita dari Puskesmas” (C-7).

b) Perlindungan asuransi

"Penyelamatan darurat berisiko, dan kader kesehatan tidak memiliki perlindungan asuransi cedera" (S-4).

“Kita semua harus diasuransikan terhadap kecelakaan sesuai dengan aktivitas PRB banjir dan kemampuannya untuk menanggung asuransi semacam itu” (C-2).

"Jika kita bekerja untuk kemanusiaan, Puskesmas dan dinas kesehatan harus melindungi kita secara sosial dan ekonomi" (C-3).

“Jika saya berpartisipasi untuk PRB banjir, saya tidak yakin apakah ada lembaga yang akan memberi saya perlindungan jiwa. Kita perlu memilikinya untuk pekerjaan kita ”(C-6).

c) Upah yang tidak mencukupi

“Kader kesehatan umumnya diberi beberapa upah” (S-6).

“Ada kurangnya insentif untuk kegiatan kader kesehatan di hari-hari rutin, bahkan selama banjir" (C-8).

d) Kurangnya pasokan logistik dalam situasi darurat

"Kami memiliki beberapa peralatan kesehatan di sini, tetapi semua sekarang sudah kedaluwarsa atau ada yang hilang" (C-3).

e) Kendaraan tidak memadai

“Saya tidak memiliki kendaraan yang memadai ke tempat persediaan medis kamp” (C-2).

Tema Faktor 4: Hambatan yang Ada

a) Jalan rusak

“Ada kalanya banjir dan malam hari dan kami tidak dapat mencapai tempat yang diberikan karena jalan rusak dan kami tidak memiliki kendaraan yang memadai. Itu sulit” (C-5).

b) Koordinasi dan mekanisme pengutusan yang tidak efektif

"Karena kurangnya koordinasi yang efektif, kader kesehatan sering gagal memainkan peran mereka dalam upaya penyelamatan darurat" (M-5).

c) Tanggung jawab keluarga

“Saya seorang janda dan punya anak. Jadi ketika saya dipanggil untuk bertugas, saya tidak punya waktu karena sibuk pekerjaan saya. Saya harus menjual ikan dan membantu pekerjaan suami saya untuk mendapatkan penghasilan keluarga karena dari sumber itu yang saya gunakan untuk memberi makan keluarga dan membayar sewa daripada ikut ke penugasan tanpa dibayar”(C-7).

d) Jarak yang tidak terjangkau, dan membutuhkan biaya dan waktu

“Ketika banjir terjadi, kami tidak dapat datang karena jarak yang jauh dan akses yang tidak terjangkau ke pusat unit koordinasi lapangan” (C-6).

Tema Faktor 5: Niat Partisipasi untuk PRB Banjir

a) Untuk menolong orang

"Saya menjadi kader kesehatan karena saya benar-benar suka menolong orang, saya merasa terpanggil untuk menjadi kader kesehatan dan berbagi bakat dan waktu saya dengan orang lain" (C-5).

b) Untuk mengurangi dampak penyakit di masyarakat

Kami bersedia mengambil peran tambahan seperti di bagian pengukuran tekanan darah, pendaftaran, penimbangan, dan pengukuran lain di masyarakat. Moto kami adalah kami melakukan perbuatan baik dan Allah akan membayar kami kemudian” (C-4).

c) Untuk meningkatkan kesehatan dan menyelamatkan hidup di masyarakat

“Kader kesehatan bekerja dengan pasien untuk membantu pasien menentukan pilihan yang tepat bagi mereka. Mereka dapat meluangkan waktu untuk membangun hubungan dengan pasien dan benar-benar membantu mereka dalam pengambilan keputusan. Karena itu, pasien dapat menjadi lebih sadar diri dan menemukan solusi untuk kebutuhan mereka" (M-6).

d) Berperan sebagai kader kesehatan

"Kami dapat menggunakan pengetahuan kami untuk memberikan informasi kepada pasien tentang PHBS ketika banjir terjadi" (C-7).

e) Untuk membangun jejaring sosial

“...karena sering membuatku lebih dekat dengan masyarakat, orang-orang dan daerah lain. Saya menikmati bertemu orang yang berbeda dari latar belakang dan budaya yang berbeda sambil melaksanakan peran sebagai kader kesehatan" (C-2).

Appendix 3: Self-Administered Questionnaire

English version

Ref. No:

1. Where do you live? ……. urban village
2. How old are you? ..... years old
3. Gender: [ ]. Male [ ]. Female

4. Please check your religion:
   [ ]. Islam [ ]. Catholic [ ]. Christian/Protestant [ ]. Hindu [ ]. Buddha [ ]. Other

5. Please check your marital status.
   [ ]. Single [ ]. Married [ ]. Other *(please specify)*: ……

6. How many children do you have? [ ]. None [ ]. ≤2 children [ ]. >2 children

7. With whom are you living in the same house? Select all that apply.
   [ ]. Parent(s) [ ]. Husband or Wife [ ]. Child
   [ ]. Brother(s), Sister(s), Brother(s) in Law and/or Sister(s) in Law
   [ ]. Other *(please specify)*:……..

8. Please check your highest education level.
   [ ]. Elementary school [ ]. Junior high school [ ]. Senior high school
   [ ]. Vocational school [ ]. University [ ]. Others *(please specify)*:.....

9. In addition to your work as a health cadre member, what are your other occupations?
   Please specify: …….

10. How many households are assigned to you? ……. households

11. Please check your average family income range every month
    [ ]. Less than IDR 2,500,000
    [ ]. IDR 2,500,000
    [ ]. More than IDR 2,500,000

12. How often do you perform each of the following activities?

		Never	**Rarely**	**Sometimes**	**Always**
12-1	I perform home visits and registering residents who have high-risk diseases for each household (e.g., pregnant women, diarrhea, dengue fever, malnutrition, acute respiratory infections, typhus, TB, etc.)				
12-2	I attend meetings with Puskesmas and/or health office				
12-3	I deliver health promotion on the Clean and Healthy Living Community Behavior (PHBS) at village				
12-4	I mobilize and transport patients in my community in emergencies situations				
12-5	I participate to prepare, organize and deliver for food nutrition at a village				
12-6	I provide basic first aid for emergencies at community				
12-7	I perform eradication of mosquito for each household				

13. Please rate perceived support from whom mentioned below both in routine days and in emergencies

		No Support	A Little Support	Good Support	Best Support
13-1	My family, relatives, and friends				
13-2	Community people				
13-3	Health personnel at Puskesmas				
13-4	Health officers				

14. What kinds of support do you need to better perform your work as health cadre in the flood events?

		Not Important	A Little Important	Important	Very Important
14-1	Direction and supervision from the Puskesmas and/or the health office				
14-2	Health and safety insurance for me				

15. Please rate difficulties you faced as health cadres working in the flood events.

		Absolutely Inappropriate	Inappropriate	Appropriate	Absolutely Appropriate
15-1	Damaged roads prevented me from reaching the location of the flood				
15-2	I have an inadequate stipend for operational				
15-3	Lack of effective coordination and too many rescuers came during emergencies. It caused chaos in the flood events				
15-4	Lack of health equipment in emergency support				
15-5	It is hard for me to leave my family when Puskesmas assigned me to provide humanitarian aid in the flood affected area				
15-6	I don't have an adequate vehicle such as motor bike				
15-7	Unreachable distance to the coordination unit center. I took a cost and a long time to reach there				

16. I want to participate in the flood disaster:
[ ]. No [ ]. Yes

17. If you answered “YES” on Question No. 16, please rate about what motivates you to participate in the flood.

		Disagree	Somewhat Agree	Agree	Strongly Agree
17-1	I wish to help my family, relatives and friends				
17-2	I wish to reduce the impact of diseases due to flooding				
17-3	I wish to improve health and save lives people in community				
17-4	I was elected as a health cadre; this is my role				
17-5	It gives me an opportunity to build social networks and connect with others				

If there is any opinion in your work as health cadres both in daily life and in the flooding event, please describe below.

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Thank you for your time and cooperation

Indonesian language

No. Ref. :

1. Di mana Anda tinggal? Kelurahan …….
2. Berapa umur Anda? ..... tahun
3. Jenis kelamin: [ ]. Laki-laki [ ]. Perempuan

4. Agama:
   [ ]. Islam [ ]. Katolik [ ]. Kristen/Protestan [ ]. Hindu [ ]. Buddha [ ]. Lainnya

5. Status pernikahan:
   [ ]. Belum menikah [ ]. Menikah [ ]. Lainnya *(sebutkan)*: ……

6. Berapa jumlah anak dalam keluarga Anda? [ ]. Tidak ada [ ]. ≤2 anak [ ]. >2 anak

7. Bersama siapa Anda tinggal di dalam satu atap rumah? Bisa pilih lebih dari satu jawaban.
   [ ]. Orang tua [ ]. Suami atau Istri [ ]. Anak
   [ ]. Saudara laki-laki, saudara perempuan, ipar laki-laki dan/atau ipar perempuan
   [ ]. Lainnya *(sebutkan)*:……..

8. Pendidikan terakhir Anda.
   [ ]. SD [ ]. SMP [ ]. SMA
   [ ]. D3 [ ]. S1/S2/S3 [ ]. Lainnya (*sebutkan)*:.....

9. Selain sebagai kader kesehatan, apa pekerjaan Anda sekarang?
   Tolong sebutkan: …….

10. Berapa banyak jumlah KK yang ditugaskan kepada Anda? ……. KK

11. Berapa rupiah kisaran jumlah pendapatan keluarga Anda setiap bulannya?
    [ ]. Kurang dari Rp 2,500,000
    [ ]. Rp 2,500,000
    [ ]. Lebih dari Rp IDR 2,500,000

12. Seberapa sering Anda melakukan aktivitas kegiatan berikut?

		Tidak Pernah	**Jarang**	**Kadang-Kadang**	**Selalu**
12-1	Saya melakukan kunjungan rumah dan memasukkan ke daftar untuk penduduk yang memiliki penyakit berisiko tinggi untuk setiap KK (missal: ibu hamil, pasien diare, demam berdarah, gizi kurang, ISPA, tipus, TB, dll.)				
12-2	Saya menghadiri pertemuan dengan Puskesmas dan/atau dinas kesehatan				
12-3	Saya menyuluh promosi kesehatan tentang Perilaku Hidup Bersih dan Sehat (PHBS) di desa				
12-4	Saya mengantar dan merujuk pasien di desa saya dalam situasi darurat				
12-5	Saya ikut berpartisipasi menyiapkan, menata, dan memberikan gizi makanan di desa				
12-6	Saya memberikan pertolongan pertama dasar (P3K) di masyarakat				
12-7	Saya ikut melakukan pemberantasan nyamuk (Jumantik) di setiap KK wilayah saya				

13. Seberapa besar dukungan yang Anda rasakan dari yang disebutkan di bawah ini baik dalam hari biasa dan dalam keadaan darurat.

		Tidak Ada Dukungan	**Kurang Dukungan**	**Didukung Baik**	**Didukung Sangat Baik**
13-1	Keluarga, kerabat, dan teman saya				
13-2	Warga masyarakat				
13-3	Petugas kesehatan Puskesmas				
13-4	Petugas dinas kesehatan				

14. Seberapa pentingkah dukungan yang Anda butuhkan di bawah ini untuk melakukan pekerjaan Anda lebih efektif saat situasi banjir?

		Tidak Penting	**Kurang Penting**	**Penting**	**Sangat Penting**
14-1	Arahan dan pengawasan dari Puskesmas dan/atau dinas kesehatan				
14-2	Asuransi kesehatan dan keselamatan untuk saya				

15. Berikan penilaian Anda terkait kesulitan yang dihadapi sebagai kader kesehatan saat banjir melanda di daerah Anda.

		Sangat Tidak Sesuai	**Tidak Sesuai**	**Sesuai**	**Sangat Sesuai**
15-1	Jalan yang rusak mencegah saya mencapai lokasi banjir				
15-2	Saya memiliki upah yang tidak memadai untuk operasional				
15-3	Kurangnya koordinasi yang efektif dan penyelamat/penolong lain yang terlalu banyak berdatangan selama keadaan darurat, menyebabkan kekacauan ketika peristiwa banjir				
15-4	Kurangnya dukungan peralatan kesehatan dalam situasi darurat				
15-5	Sulit bagi saya untuk meninggalkan keluarga saya ketika Puskesmas menugaskan saya untuk memberikan bantuan kemanusiaan di daerah yang terkena banjir				
15-6	Saya tidak memiliki kendaraan yang memadai seperti sepeda motor				
15-7	Jarak yang tidak terjangkau ke pusat unit koordinasi. Saya membutuhkan biaya dan waktu yang lama untuk sampai di sana				

16. Saya ingin berpartisipasi dalam penanggulangan resiko bencana banjir:
[ ]. Tidak [ ]. Ya

17. Jika Anda menjawab "YA" pada Pertanyaan No. 16, apa yang memotivasi Anda ingin berpartisipasi dalam penanggulangan resiko bencana banjir.

		Tidak Setuju	**Kurang Setuju**	**Setuju**	**Sangat Setuju**
17-1	Saya ingin membantu keluarga, kerabat, dan teman saya				
17-2	Saya ingin mengurangi dampak penyakit akibat banjir				
17-3	Saya ingin meningkatkan tingkat kesehatan dan menyelamatkan hidup orang-orang di wilayah saya				
17-4	Saya terpilih sebagai kader kesehatan; ini peran saya				
17-5	Ini memberi saya kesempatan untuk membangun jejaring sosial dan terhubung dengan orang lain				

Jika ada pendapat lain terkait aktivitas kegiatan Anda sebagai kader kesehatan baik dalam rutinitas sehari-hari maupun dalam peristiwa banjir, tolong jelaskan di bawah ini.……
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Terima kasih atas waktu dan kerjasama Anda

Appendix 4: Letter of Approval

Jan 22, 2019

Letter of Approval

I hereby approve the following research plan as a result of reviewing by the Ethics Committee of University of Kochi, based on the their stipulation.

Sayumi Nojima

President
University of Kochi
Sayumi Nojima

****

Applicant : Hastoro Dwinantoaji

Research Title : Identification of Factors Influencing Health Cadres Involvement in Tidal Flood Disaster Response Volunteering in Indonesia

Receipt Number : 18-60

Hereby we notify that above research plan fulfills all of the prerequisites for review standards and, under the stipulation of Ethics Committee in Article 8.6, approve this research.

Director
Nursing Research Ethics Committee
University of Kochi
Ayami Nakano

PEMERINTAH PROVINSI JAWA TENGAH
DINAS PENANAMAN MODAL
DAN PELAYANAN TERPADU SATU PINTU
Jalan Mgr. Sugiyopranoto Nomor 1 Semarang Kode Pos 50131 Telepon : 024 – 3547091, 3547438, 3541487 Faksimile 024-3549560 Laman http ://dpmptsp.jatengprov.go.id Surat Elektronik dpmptsp@jatengprov.go.id

REKOMENDASI PENELITIAN
NOMOR : 070/9309/04.5/2019

Dasar :
1. Peraturan Menteri Dalam Negeri Republik Indonesia Nomor 07 Tahun 2014 tentang Perubahan atas Peraturan Menteri Dalam Negeri Republik Indonesia Nomor 64 Tahun 2011 tentang Pedoman Penerbitan Rekomendasi Penelitian ;
2. Peraturan Gubernur Jawa Tengah Nomor 72 Tahun 2016 tentang Organisasi dan Tata Kerja Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Jawa Tengah ;
3. Peraturan Gubernur Jawa Tengah Nomor 18 Tahun 2017 tentang Penyelenggaraan Pelayanan Terpadu Satu Pintu di Provinsi Jawa Tengah ;
4. Keputusan Gubernur Jawa Tengah Nomor 69 tahun 2003 tentang Perubahan Atas Keputusan Gubernur Jawa Tengah Nomor 64 Tahun 2002 tentang Pejabat Pelaksana Tugas (PLT), Pejabat Pelaksana Harian (PLH) dan Pejabat Yang Menjalankan Tugas (YMT) Pada Unit Organisasi Perangkat Daerah Provinsi Jawa Tengah ;
5. Keputusan Gubernur Jawa Tengah Nomor 821.2/27 tahun 2019 tentang Penunjukan Pejabat Pelaksana Tugas (Plt) Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Jawa Tengah.

Memperhatikan : Surat Ketua Progam Studi Teknik Perencanaan Wilayah Dan Kota Universitas Islam Sultan Agung Tanggal : 29 Januari 2019 Hal : Permohonan Ijin Penelitian

Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Jawa Tengah, memberikan rekomendasi kepada :

1. Nama : HASTORO DWINANTOAJI
2. Alamat : Jl. Nakulo 43 RT 050/RW 011 Wirobrajan, Yogyakarta 55252
3. Pekerjaan : Mahasiswa

Untuk : Melakukan Penelitian dengan rincian sebagai berikut :

a. Judul Proposal : IDENTIFIKASI FAKTOR-FAKTOR YANG MEMPENGARUHI KETERLIBATAN KADER MASYARAKAT UNTUK TANGGAP BENCANA BANJIR DI SEMARANG
b. Tempat / Lokasi : Dinas Kesehatan Kota Semarang, Puskesmas di Wilayah Kerja Kecamatan Semarang Timur, dan Kader Masyarakat Kelurahan Kemijen Kecamatan Semarang Timur
c. Bidang Penelitian : Fakultas Teknik Program Studi Teknik Perencanaan Wilayah dan Kota
d. Waktu Penelitian : 02 April 2019 sampai 07 Juni 2019
e. Penanggung Jawab : Dr. Hj. Mila Karmilah, S.T, M.T
f. Status Penelitian : Baru
g. Anggota Peneliti : Hastoro Dwinantoaji, S.Kep., Ners., Hasti Widyasamratri, S.Si, M.Eng, Ph.D., Prof. Sakiko Kanbara, Ph.D.
h. Nama Lembaga : Fakultas Teknik Program Studi Teknik Perencanaan Wilayah dan Kota Universitas Islam Sultan Agung (UNISSULA)

Ketentuan yang harus ditaati adalah :

a. Sebelum melakukan kegiatan terlebih dahulu melaporkan kepada Pejabat setempat / Lembaga swasta yang akan di jadikan obyek lokasi;
b. Pelaksanaan kegiatan dimaksud tidak disalahgunakan untuk tujuan tertentu yang dapat mengganggu kestabilan pemerintahan;
c. Setelah pelaksanaan kegiatan dimaksud selesai supaya menyerahkan hasilnya kepada Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Jawa Tengah;
d. Apabila masa berlaku Surat Rekomendasi ini sudah berakhir, sedang pelaksanaan kegiatan belum selesai, perpanjangan waktu harus diajukan kepada instansi pemohon dengan menyertakan hasil penelitian sebelumnya;
e. Surat rekomendasi ini dapat diubah apabila di kemudian hari terdapat kekeliruan dan akan diadakan perbaikan sebagaimana mestinya.

Demikian rekomendasi ini dibuat untuk dipergunakan seperlunya.

Semarang, 31 Januari 2019

Plt. KEPALA DINAS PENANAMAN MODAL DAN
PELAYANAN TERPADU SATU PINTU
PROVINSI JAWA TENGAH
Kepala Bidang Pengawasan dan Pengendalian
Penanaman Modal

DPMPTSP

DIDIK SUBIYANTORO

DPMPTSP 31 Januari 2019

SALINAN

YAYASAN BADAN WAKAF SULTAN AGUNG
UNIVERSITAS ISLAM SULTAN AGUNG (UNISSULA)
Jl. Raya Kaligawe Km.4 Semarang 50112 Telp.(024) 6583584 (8 Sal) Fax (024) 6582455
email: informasi@unissula.ac.id web: www.unissula.ac.id

Semarang, 24 Januari 2019

Lamp. : **1 (Satu) Set Proposal Penelitian**
Hal : **Permohonan Ijin Penelitian**

Kepada Yth. **Kepala Dinas Kesehatan Kota di Semarang**

Assalamu'alaikum Wr. Wb.
Dengan hormat,

Dalam rangka pelaksanaan penelitian dengan judul **"IDENTIFIKASI FAKTOR-FAKTOR YANG MEMPENGARUHI KETERLIBATAN KADER MASYARAKAT UNTUK TANGGAP BENCANA BANJIR DI SEMARANG"** oleh tim peneliti Universitas Islam Sultan Agung (UNISSULA) sebagai berikut:

Nama peneliti : 1. Hastoro Dwinantoaji, S. Ners

Nama pembimbing : 1. Dr. Hj. Mila Karmilah, S.T, M.T
2. Hasti Widyasamratri, S.Si, M.Eng, Ph.D
3. Prof. Sakiko Kanbara, Ph. D

Waktu penelitian : Februari 2019 s.d. Juli 2019
Lokasi penelitian : 1. Dinas Kesehatan Kota Semarang
2. Puskesmas di Wilayah Kerja Kec. Semarang Timur
3. Kader Masyarakat di Kel. Kemijen, Kec. Semarang Timur

Berkaitan dengan hal tersebut, kami mohon kepada Bapak/Ibu berkenan memberikan ijin dan rekomendasi kepada yang bersangkutan untuk dapat mengambil data yang diperlukan guna terlaksananya penelitian dimaksud.

Demikian permohonan kami sampaikan. Atas diperkenankannya permohonan ini, kami mengucapkan terima kasih.

Wassalamu'alaikum Wr. Wb.

Ketua Pusat Studi Sustainable Development
Prodi Teknik Perencanaan Wilayah dan Kota
Universitas Islam Sultan Agung

Dr. Hj. Mila Karmilah, S.T, M.T
NIDN :062121076901

YAYASAN BADAN WAKAF SULTAN AGUNG
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email: informasi@unissula.ac.id web: www.unissula.ac.id
Bismillah Membangun Generasi Khaira Ummah

Semarang, 7 Februari 2019

Lamp. : **1 (Satu) Set Proposal Penelitian**
Hal : **Permohonan Ijin Penelitian**

Kepada Yth. **Kepala Puskesmas .....**
di Semarang

Assalamu'alaikum Wr. Wb.
Dengan hormat,

Dalam rangka pelaksanaan penelitian dengan judul **"IDENTIFIKASI FAKTOR-FAKTOR YANG MEMPENGARUHI KETERLIBATAN KADER MASYARAKAT UNTUK TANGGAP BENCANA BANJIR DI SEMARANG"** oleh tim peneliti Universitas Islam Sultan Agung (UNISSULA) sebagai berikut:

Nama peneliti : 1. Hastoro Dwinantoaji, S. Kep, Ners

Nama pembimbing : 1. Dr. Hj. Mila Karmilah, S.T, M.T
2. Hasti Widyasamratri, S.Si, M.Eng, Ph.D
3. Prof. Sakiko Kanbara, Ph. D

Waktu penelitian : Februari 2019 s.d. Juli 2019
Lokasi penelitian : 1. Dinas Kesehatan Kota Semarang
2. Puskesmas .....
3. Kader Masyarakat di Kel. Kemijen, Kec. Semarang Timur

Berkaitan dengan hal tersebut, kami mohon kepada Bapak/Ibu berkenan memberikan ijin dan rekomendasi kepada yang bersangkutan untuk dapat mengambil data yang diperlukan guna terlaksananya penelitian dimaksud.

Demikian permohonan kami sampaikan. Atas diperkenankannya permohonan ini, kami mengucapkan terima kasih.

Wassalamu'alaikum Wr. Wb.

Ketua Pusat Studi Sustainable Development
Prodi Teknik Perencanaan Wilayah dan Kota
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Dr. Hj. Mila Karmilah, S.T, M.T
NIDN :062121076901