

# Community-Based Disaster Risk Management Model for Covid-19 in Tembi Hamlet

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## Community-Based Disaster Risk Management Model for Covid-19 in Tembi Hamlet

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### Abstract

Covid-19 Pandemic arrived in the fifth month of Timbulharjo Village, Sewon District, Bantul Regency, Special Region of Yogyakarta. Until now there are still fewer alternative activities of villagers in responding. Some villages have carried out prevention activities. This research was conducted to see the practice of community-based disaster risk management (CBDRM) by the independence of locals in their initiatives to deal with Covid-19. This research uses a qualitative - participatory approach with Participatory Action Research (PAR). Collaborative community activities and effectively managing the local resources help citizens' solve their problems and become a model for developing Mitra Desa. The ongoing process stimulates the independence of the people and becomes a place for local initiatives that are in line with local resources in dealing with Covid-19.

Keywords: Cbdrm, Covid-19, Disaster Management, Disaster Risk Reduction, Community



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## I. INTRODUCTION

Covid-19 pandemic has been a huge struggle for every state in the world including Indonesia. World Health Organization on 11 March 2020 confirms Covid-19 as a global pandemic. Based on EM-DAT, there are approximately 464 major disasters that had occurred in Indonesia between 1900 and 2016 killing more than 240,000 people, putting the country at the top rank (World Bank, 2016). Indonesia is a country with a variety of disasters dealing with this pandemic as a double challenge. Guidelines for the Prevention and Control of Coronavirus Disease (Covid-19) 5th Revision of Ministry of Health regulate that the positive Covid-19 person with asymptomatic, mild, and moderate for ten days self-quarantine (Indonesian Ministry of Health, 2020). Hospitals effectively can only manage the patient with a severe condition. Yogyakarta already implements this policy since 15 August 2020

(*Tribunnews*, 2020). Thus, the community was forced to take the initiative to provide independent quarantine facilities and other supporting responses to meet community needs. The act of establishing independent quarantine and community-based surveillance is also a strategy recommended by the Ministry of Health in dealing with Covid-19. The Minister of Villages, Development of Disadvantaged Areas, and Transmigration also stipulated the Village New Normal Protocol to accelerate the handling and break the chain of Covid-19 transmission at the Village (Kepmendes PDPTT No. 63/2020). Interestingly, Tembi Hamlet - as the object of research - has taken actions long before the health ministry and the village ministry recommendation. For example, since the March community has been creating an independent quarantine place by utilizing a network with the external actors. This kind of response was initiated and independently done by the community called a community-based disaster risk management (CBDRM).

Tembi Hamlet CBDRM practice is an imbalance with conditions in other communities that are unprepared to respond to Covid-19 at their level of authority. Media coverage has demonstrated this condition in Magelang (*Kompas*, 2020b), Pati (*Mitrapost*, 2020), and Jombang (*Jawa Post*, 2020). This condition makes it important to create a community-level model that can be replicated in other areas. The researcher argues that this modeling is useful in application to hamlet and village level initiative. This replication is expected to make other villages or hamlet achieve risk reduction initiatives and resilience in facing the threat of Covid-19. This model does not only cover external activities in response to Covid-19, but also builds citizen movement to be aware, confident, capable, and committed to disaster risk reduction activities

## II. LITERATURE REVIEW

### II.1. Brief Background of Tembi Hamlet

The research was conducted in Tembi Hamlet, Timbulharjo Village, Sewon District, Bantul Regency. Tembi Hamlet in the Bantul Regency was affected by the Yogyakarta earthquake in 2006. There are 1100 people in Tembi Hamlet. Tembi Hamlet's majority being farmers. The traditionality of Tembi Hamlet has become a tourist attraction so there are several hotels and homestays both owned by the company and residents themselves. Recorded on August 13, 2020, cases of positive residents of Covid-19 in this sub-district reached 16 people (Bantul Covid-19 Taskforce Website, 2020). So it is the highest district in the case of positive residents of Covid-19. In terms of health facilities, Timbulharjo Village does not have a hospital but has a health center and Polyclinic (BPS Kabupaten Bantul, 2019). Based on the records of the activities of the Tembi Hamlet Covid-19 Team, the first response that was carried out for Covid-19 was spraying disinfectants in public facilities on March 23, 2020 (Satgas Covid-19 Dusun Tembi, 2020). This first response is the key to increasing cooperation between communities, by involving all members of the society of all ages.

Tembi Hamlet continued activities in the form of planning public health protocols, activities to reduce the impact of the economy and food, to building infrastructure.

$$RC19 = \frac{Mo \times Pi}{Im \times Ph}$$

RC19	: Risk of Covid 19
Mo	: Level of Mobility
Pi	: Level of Physical Interaction
Im	: Level of Immunity
Ph	: Level of Positive Habit

## 2 II.2. Community Based Disaster Risk Management

Community-Based Disaster Risk Management (CBDRM) is an approach of promoting the involvement of grassroots-community disaster risk management at the local level. 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 is the optimal mobilization of resources that the community has and has control over and becomes an integral part of the community's daily lives (Eko Teguh Paripurno, 2014).

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Community-based approaches to reduce disaster risk have been known by various different names. Some called it community-based disaster risk management (CBDRM), community-based disaster management (CBDM), community-driven disaster risk reduction (CBDRR), community-based disaster preparedness (CBDP), community-driven disaster risk management (CDDRR), community-managed disaster risk reduction (CMDRR), and community-managed disaster risk management (CMDRM) (Lassa, J.A., Boli, Y., Nakmofa, Y, 2018). There is not yet any social research on the history of Community Based Disaster Risk Management (CBDRM). The first adoption of CBDRM was in the context of the Merapi volcano of Yogyakarta back as early as 1994. It started with the assessment of the behavior of the community living around Merapi who survived the volcano eruption in 1994. Activists of KAPPALA Indonesia – a local Nature Lovers and Environment Activists NGO – of Indonesia developed a self-learning and conceptualization of their works with the Merapi community (Eko Teguh Paripurno, 2014).

## II.3. Risk Factor of Covid-19

The risk of Covid-19 is directly proportional to mobility and physical interaction and inversely proportional to immunity levels and levels of health services. The level of mobility includes, among others, the mode of transportation, distance traveled, space, and time. The level of physical interaction includes crowd density, distance, type of crowd, length of crowd time. Immunity levels include age and health. The level of positive habit means how each individual has positive habits for himself, to be resilient from exposure to Covid-19 by clean clothing, routine disinfectant, use of masks, exercise, and nutrition.

Thus, the individual risk of Covid-19 is determined by these factors. The higher the individual's mobility (Mo) and physical interaction (Pi), the greater the individual's risk. However, if it is balanced with high levels of immunity (Im) and Positive Habit (Ph), then the individual risk can also be reduced. Of course, to achieve low risk, each individual needs

to reduce the level of mobility and physical interaction, and strengthen the level of immunity (Im) and positive habit (Ph).

	M o	Pi		
Im	1 0	1 0	2 0	High mobility (Mo) and physical interaction (Pi) with a low of immunity (Im) and positive habit (Ph) making individuals have a high risk on Covid-19.
Ph	1 0	1 0	2 0	
			4 0	

	M o	Pi		
Im	0 1	0 1	0 2	High immunity (Im) and positive habit (Ph) with low mobility (Mo) and physical interaction (Pi) with low mobility and physical interaction making individuals have a low risk on Covid-19.
Ph	0 1	0 1	0 2	
			0 4	

	M o	Pi		
Im	0 0	0 0	0 0	Low immunity (Im), positive habit (Ph), mobility (Mo), and physical interaction (Pi) making individual have a medium risk on Covid-19.
Ph	0 0	0 0	0 0	
			0 0	

	Mo	Pi		
Im	1 1	1 1	2 2	High mobility (Mo), physical interaction (Pi), immunity (Im), and positive habit (Ph) making individual have a medium risk on Covid-19.
Ph	1 1	1 1	2 2	
			4 4	

Figure 1. Risk Level on Covid-19

### III. RESEARCH METHODOLOGY

This research is qualitative research using Participatory Rural Appraisal (PRA) tools. PRA is a set of participatory approaches and methods to learn about rural life and conditions by, together, and from rural communities (Robert Chambers, 1994). The research was conducted in the form of documentary and exploratory studies of community and stakeholder practices. The documentary study was carried out by re-reading the document of program activities carried out by the communities in dealing with Covid-19. Explorative assessments were carried out directly with interviews representing communities in Tembi Hamlet. The use of PRA tools is certainly consistent with qualitative research which has the core of understanding society through their frame of reference. The PRA technique was formed by drawing directly from qualitative social research. Launched from Campbell, that PRA is part of qualitative research (Campbell, 2001).

In disaster risk reduction, PRA is a key assessment tool to help choose strategies that are meaningful and useful for vulnerable communities (Kotze & Holloway, 1996). PRA as an approach to assess risks as well as vulnerabilities and capacities is a valuable method in disaster reduction planning at the community level. From a disaster reduction perspective, PRA is one tool that can be used to assess key vulnerabilities and capacities, as these relate to the risks faced by disaster-prone communities. Compared to other assessment methods, PRA is particularly powerful, as it: a) actively involves community; b) empowers the community to identify the risks and priorities, as well as capacities to reduce these risks; c) provides a picture of the community's perceptions of the risks it faces; d) allows both community insiders and outsiders to jointly identify risk reduction measures – is both time and cost-effective (Kotze & Holloway, 1996).

## IV. FINDING AND DISCUSSION

### IV.1. Condition of Tembi Sub Village

#### IV.1.1. History of Covid-19 Response in Tembi Hamlet

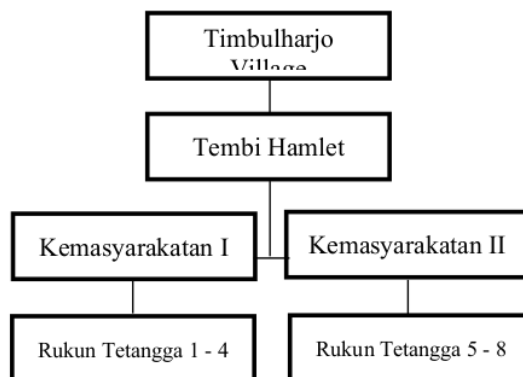
The response starts from the smaller scope of Tembi Hamlet, namely Kemasyarakatan. Tembi Hamlet divided into two kemasyarakatan, namely Kemasyarakatan I and Kemasyarakatan II. Below Kemasyarakatan there are Rukun Tetangga 1 - 8.

Figure 2. Timbulharjo Village Structure

On 22 March 2020, the administrator of Kemasyarakatan II discuss by Whatsapp about the needs for a rapid response regarding the Covid-19 Virus threat. This activity involves 36 people in the Whatsapp Group. They agreed to disinfectant spraying on the public facilities in Tembi Hamlet on the next day. 22 March 2020, the administrator of Kemasyarakatan discuss by Whatsapp about the needs for a rapid response regarding the Covid-19 Virus threat. This activity involves 36 people in the Whatsapp Group. They agreed to disinfectant spraying on the public facilities in Tembi Hamlet on the next day. On 30 March, the process of response ongoing into another aspect, such as handwashing and liquid soap making. In the process of making a hand-washer, the administrator of Kemasyarakatan II seeing that area of Kemasyarakatan I still have no responsibility regarding the risk of Covid-19. The condition caused by the vacuum of administrator in Kemasyarakatan I. Thus, the administrator of Kemasyarakatan II, resident of Kemasyarakatan I, and head of Tembi Hamlet hold a meeting to discuss the Covid-19 joint response. The meeting decided to form a Covid-19 Team to respond at Hamlet level, and the head of Kemasyarakatan II acts as the head of the Covid-19 Team. After the establishment, all the actors in the Covid-19 response strategy involved every household in Tembi Hamlet. Also, Covid-19 Team starts to gather donations from a business entity that exists in Tembi Hamlet.

#### IV.1.2. Damage of Covid-19 on Tembi Hamlet Community

Covid-19 making a severe impact on informal workers by being unemployed. Although, other office residents also feel such salary cuts, and workers that work in factories get unpaid leave until an unspecified time. Tembi Hamlet as a tourism destination also loses many tourists, thus hotels and tourism workers decrease profit. This financial impact affects the psychology of the community, especially the most vulnerable ones, the lower income family. Being stress and anxious for the future after Covid-19 being a problem for every household.



Some other, fear of the Covid-19 spread into their family and the loved ones. While rural communities frequently gather as part of their daily life, but Covid-19 forced them to cancel and postponed the gathering and social events. Meanwhile, the rural community really enjoy

a social gathering. In the long run, if the condition not being better, the impact will be severe, because Covid-19 not only reducing the income of the household but also dissociate the community from its social excitement.

## IV.2. Implementation and Impact of Tembi Hamlet CBDRM

### IV.2.1. Prevention of Covid-19 Transmission

On 23 March 2020, because of the rarity of disinfectant liquid, the administrator of *Kemasyarakatan II* send eight-person from the youth organization to hunt disinfectants from every store in Parangtritis Road. Then, the community starts to spraying the public facilities. It prioritizes public facilities such as roads, mosques, and other places where the community commonly gathers. Sterilizing places that have a high risk carried out to prevent the spread of Covid-19. A week after that, On 30 March 2020 Kemasyarakatan receive disinfectant support from Timbulharjo Village. This second-time sterilization focused on communities' houses in Rukun Tetangga. Kemasyarakatan distributes small sprays and disinfectants for Rukun Tetangga to clean the doors of houses and household items that are frequently used by family members.

To support further public health, Kemasyarakatan together with the Rukun Tetangga install handwashing places in a public area such as food stalls, alleys, workshops, and children's playgrounds. Along with the installation, the community individually took the initiative to install handwashing in front of their own houses. Also, liquid soap is made by dissolving bar soap. This liquid soap is placed in public handwashing places. On the same day, the community starts crafting hand sanitizer. Learning from Youtube, hand sanitizers are made using alcohol mixed with aloe vera and then packed in small bottles. Every person with a high mobility rate based on Rukun Tetangga data receives one hand sanitizer. Nine women that work as a tailor in Tembi Hamlet start to crafting mask for every person in the Hamlet. A total of 1250 masks were crafted. Education banners used by the community to campaign and educating visitors and residents about maintaining a clean life and risk of Covid-19.

On 5 April 2020, the community carried out the construction of checkpoint gates for all road accesses that enter Tembi Hamlet. This action has a mission to controlling the mobilization of residents and visitors, thus anticipate the spread of Covid 19. To maintain security, the community does a safety patrol at each gate. This patrol aiming to find out the mobilization of Tembi residents and people outside Tembi in every access. It's done by night shift from 22.00 to 04.00. The unexpected impact of the night shift is on the psychological effect. When residents gather, they sharing their problems and reducing their stress levels. Covid-19 give resident with low economy anxiety and stress.

Eid Al-Fitr approaching, on 14 April 2020 community preparing a quarantine facility to accommodate Tembi Hamlet resident that homecoming from out of Yogyakarta, if the family incapable to support self-quarantine in their own house. In realizing this quarantine facility, Covid-19 Team collaborates with KAPPALA Indonesia, an NGO that has an empty office in Tembi Hamlet to be used as a quarantine place. For the interior, Covid-19 Team collaborates with the University of Pembangunan Nasional "Veteran" Yogyakarta to equip the facility. The Team also collaborate with Alliance of Independence Journalist to



campaigning against Tembi Hamlet's local initiative on Covid-19. From March to August, more or less nine residents do self-quarantine in their own house.

Eid Al-Fitr and Eid Al-Adha come in a very close moment. Thus, the Covid-19 Team making protocol for Eid prayers. The location of the prayers is divided into five places, and Covid-19 Team campaigning and suggesting for every household to do the prayer by themselves in their houses if they are capable. The prayer mechanism also pays attention to health protocols, including the existence of public handwash facilities, filling in the attendance book, using masks, and keeping the distance.

#### IV.2.2. Prevention of Covid-19 Impact on Food Insecurity

To support the quarantine facility and anticipating the food crisis, Covid-19 Team cultivate the land of the village. A community that mostly farmer makes it easy for the Covid-19 Team to get the support of skill and seeds in growing carbohydrate crops and greens. To fulfill the protein, Covid-19 Team collaborates with Freshwater fish farmer to raising catfish. Every household that needs food stock could freely take this foodstuff.

#### IV.2.3. Rehabilitation on Covid-19 Impact

On 20 April 2020, the Covid-19 Team which was executed by the Division of Art and Culture held a kids coloring competition to maintain the psychology of children. Covid-19 Team assumes that the pandemic making children bored at home because the school is done by video conference. The theme of the competition is related to health and sanitation, so children could get educated at once. The competition is done by children in their own house, thus avoid gathering a lot of people in one place. This activity was attended by 80 children of Tembi Hamlet. Even so, this event is called competition, but every child gets a present of vegetable seedling to maintain their family food security.

Checkpoint gates that were carried out by the Covid-19 Team done by residents who have skills in the field of welding and building construction. Work by residents with special skills will receive payment from community funds as a reward and also aims to help the economy of residents that working informally, which is more severely affected by the pandemic. Covid-19 Team also pays some residents to take care of the communal food stocks in order to keep it growing well. The payments for both services are Rp. 100.000 per day. The Covid-19 Team also giving support to Nine women tailor group by find orders of cloth masks. Every cloth mask crafted, the tailor obtain Rp. 2.500. Lately, Team Covid-19 could find a 4.750 cloth mask order for the women tailor group, from varied consumers.

This engagement important to keep resident that work informally in order to stay have incomes. However, the Covid-19 Team also aware that this intervention is not enough.

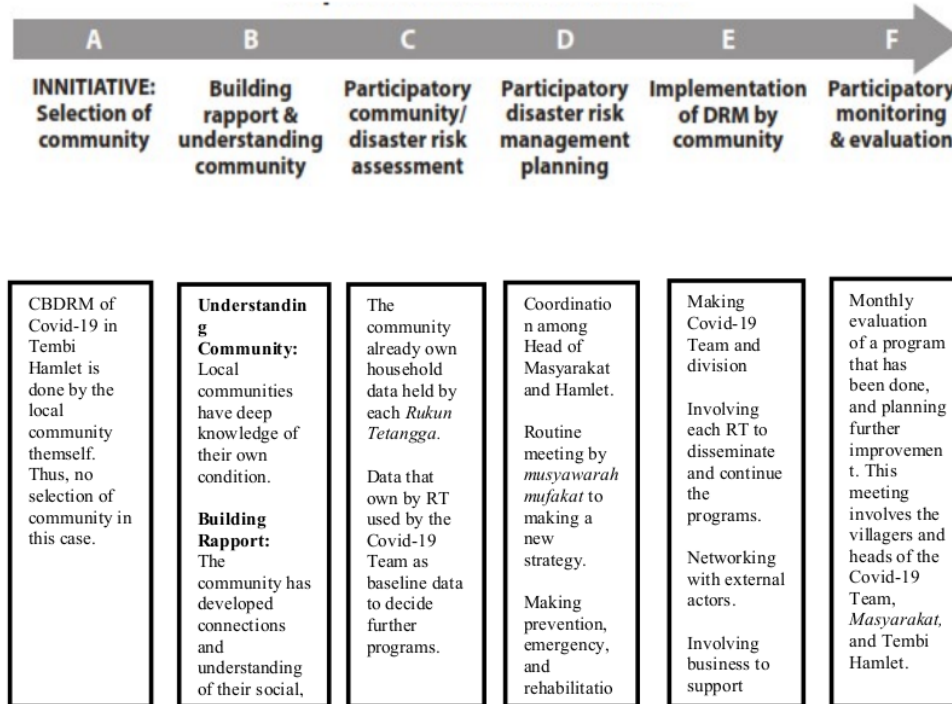


Figure 3. Model Of Community-Based Disaster Risk Management Process For Covid-19 In Tembi Hamlet

On 10 June 2020, the Covid-19 Team with the head of Tembi Hamlet and business entity discuss on the tourism planning on Covid-19 condition. Some of the agreed terms are the obligation to fulfill the health protocol, transparency on guest information, quarantining the guest, and limitation of guests' activity inside the Tembi Hamlet. This decision is valid for one month until July 10, 2020. July 10, 2020, the further discussion agreed on opening the tourism wider, but following the health protocol tightly. This decision could be a great help for the resident that work on tourism, however, the protocol must be followed to ensure the transmission of Covid-19 is not happen.

## V. CONCLUSION AND FURTHER RESEARCH

The Covid-19 response that was initiated by Kemasyarakatan II and developed into Covid-19 Team at the Hamlet level shows the importance of mobilization community resources to achieve disaster resiliency. Covid-19 clearly making an impact on the household and the community. However, the good strategy, willingness, and local resource management important to initiate disaster risk reduction. Since the initiation was purely carried out by the

local with few involvements of the village government, the community can show their own willingness to survive in this global pandemic by its own way and approach.

The community took the initiative to optimize the small things, the neglected space, such as land and unused building, and transform it into supporting facility and social support. Taking effective measures being important. It's proven, that community could manage the risk of Covid-19. By using their own local resources, the community could prevent and rehabilitate the transmission and impact of Covid-19, thus reducing the bigger risk of Covid-19 that could occur. This minimalist practice is done by Tembi Hamlet shown that every community at each level, even without the huge support of funding could survive the crisis if manage and optimize their own local resources.

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