

**TATA KELOLA BENCANA DAN TEKNOLOGI:
KOLABORASI PEMERINTAH ANTARA BPBD BANTUL DAN
MDMC DI TINGKAT LOKAL**

***DISASTER MANAGEMENT AND TECHNOLOGY:
COLLABORATIVE GOVERNANCE BETWEEN BPBD BANTUL
AND MDMC IN LOCAL LEVEL***

SKRIPSI



Disusun Oleh:

ALFINOVRIANDO

20170520033

**PROGRAM STUDI ILMU PEMERINTAHAN FAKULTAS
ILMU SOSIAL DAN ILMU POLITIK UNIVERSITAS
MUHAMMADIYAH YOGYAKARTA**

2021

HALAMAN JUDUL SKRIPSI

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SURAT PERNYATAAN KEASLIAN

Dengan ini Saya menyatakan bahwa skripsi Saya adalah asli dan belum pernah diajukan untuk mendapatkan gelar Sarjana, baik di Universitas Muhammadiyah Yogyakarta maupun di Perguruan Tinggi lainnya.

Dalam skripsi Saya tidak terdapat karya, ide, dan pendapat orang lain kecuali tertulis dengan jelas referensi yang telah dicantumkan dalam daftar pustaka.

Pernyataan ini Saya buat dengan sesungguhnya dan apabila di kemudian hari ditemukan ketidaksesuaian dengan pernyataan ini, maka Saya bersedia menerima sanksi akademik dan diproses sesuai dengan ketentuan yang telah berlaku di Universitas Muhammadiyah Yogyakarta.

Yogyakarta, 08 Agustus 2021



Alfi Novriando

HALAMAN MOTTO

“Live life. Learn lessons. Liberate yourself.”

“Setiap jalan orang jelas berbeda. Tetapi, untuk mencapai suatu tujuan, jalan kita sama, berjuang.”

HALAMAN PERSEMBAHAN

Assalamu 'alaikum wa rahmatullahi wa barakatuh.

Dalam penulisan skripsi ini, paling utama penulis memanjatkan puji dan syukur ke hadirat Allah Swt. atas segala nikmat, baik nikmat Islam, nikmat Iman, hidayah, kesehatan, dan kekuatan sehingga penulis dapat menyelesaikan skripsi ini dengan lancar tanpa halangan yang berarti. Tidak lupa penulis panjatkan selawat dan salam kepada Rasulullah Saw. yang telah menuntun umat manusia ke jalan yang benar dan senantiasa menjadi teladan bagi kita semua.

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Penulis telah menyelesaikan skripsi dengan judul **TATA KELOLA BENCANA DAN TEKNOLOGI: KOLABORASI PEMERINTAH ANTARA BPBD BANTUL DAN MDMC DI TINGKAT LOKAL** yang disusun melalui pengamatan dan penelitian dengan memperoleh informasi dari berbagai sumber, seperti buku, jurnal, berita, dokumen, media elektronik, dan situs resmi.

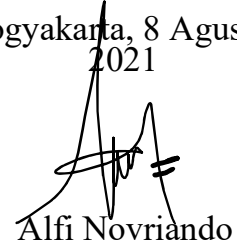
Penulisan skripsi ini dibuat untuk memenuhi persyaratan dalam memperoleh gelar Sarjana akademik Strata-1 (S-1) pada Program Studi Ilmu Pemerintahan Universitas Muhammadiyah Yogyakarta. Penulis mengucapkan terima kasih kepada pihak-pihak yang telah terlibat dan membantu penulis dalam menyelesaikan penulisan skripsi ini, antara lain:

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Yogyakarta, 8 Agustus
2021



Alfi Novriando

ABSTRAK

Mitigasi bencana alam di Kabupaten Bantul banyak memuat informasi kebencanaan berbasis Teknologi Informasi dan Komunikasi (TIK) bekerjasama dengan Lembaga Swadaya Masyarakat (LSM) seperti Muhammadiyah Disaster Management Center (MDMC). Kolaborasi menghasilkan Sumber Daya Manusia (SDM) yang siap menghadapi bencana di Kabupaten Bantul dengan memanfaatkan ICT yang telah terintegrasi dengan sistem informasi pemerintah. Temuan ini berguna untuk mengetahui bagaimana kerjasama pemerintah dalam mitigasi bencana alam berbasis TIK di Kabupaten Bantul. Metode yang digunakan adalah penelitian kualitatif dengan pendekatan studi kasus. Penelitian ini menggunakan tiga teknik pengumpulan data yaitu dokumentasi, Focus Group Discussion (FGD), dan wawancara online menggunakan media zoom untuk memperoleh data dari responden. Temuan menemukan bahwa dalam pelaksanaan kerjasama pemerintah (BPBD) dan MDMC menggunakan beberapa alat untuk media informasi kebencanaan. Keduanya memiliki komunitas yang dikhususkan untuk media kolaboratif adaptif dengan perkembangan teknologi saat ini. Sehingga mitigasi bencana alam dapat terselenggara dengan cepat dan tepat sesuai dengan tingkat kewaspadaan bencana di daerahnya masing-masing.

Kata kunci: Kolaborasi Pemerintah, Manajemen Bencana, Teknologi

ABSTRACT

Natural disaster mitigation in Bantul regency contains a lot of disaster information based on Information and Communication Technology (ICT) in collaboration with Non-Government Organization (NGO) such as Muhammadiyah Disaster Management Centre (MDMC). Collaborative produces Human Resources (HR) that are ready to deal with disasters in Bantul District by using ICT that has been integrated with the government information system. This finding is useful to know how a government collaboration in ict-based natural disaster mitigation in Bantul Regency. The method used is qualitative research with a case study approach. This research uses three data collection techniques, namely documentation, Focus Group Discussion (FGD), and online interviews using zoom media to obtain data from respondents. The findings found that in the implementation of government collaboration (BPBD) and MDMC using several tools for disaster information media. Both have a community that is devoted to adaptive collaborative media with the development of technology today. So that natural disaster mitigation can be held quickly and appropriately in accordance with the level of disaster awareness in their respective regions..

Keywords: Collaborative Government, Disaster Management, Technology

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Disaster Management and Technology: Collaborative Governance between BPBD Bantul and MDMC in Local Level

Abstract

Natural disaster mitigation in Bantul regency contains a lot of disaster information based on Information and Communication Technology (ICT) in collaboration with Non Government Organization (NGO) such as Muhammadiyah Disaster Management Centre (MDMC). Kolaborasi produces Human Resources (HR) that are ready to deal with disasters in Bantul District by using ICT that has been integrated with the government information system. This finding is useful to know how a government collaboration in ICT-based natural disaster mitigation in Bantul Regency. The method used is qualitative research with a case study approach. This research uses three data collection techniques, namely documentation, Focus Group Discussion (FGD), and online interviews using zoom media to obtain data from respondents. The findings found that in the implementation of government collaboration (BPBD) and MDMC using several tools for disaster information media. Both have a community that is devoted to adaptive collaborative media with the development of technology today. So that natural disaster mitigation can be held quickly and appropriately in accordance with the level of disaster awareness in their respective regions.

Keywords: Collaborative Government, Disaster Management, Technology

Abstrak

Mitigasi bencana alam di Kabupaten Bantul banyak memuat informasi kebencanaan berbasis Teknologi Informasi dan Komunikasi (TIK) bekerjasama dengan Lembaga Swadaya Masyarakat (LSM) seperti Muhammadiyah Disaster Management Center (MDMC). Kolaborasi menghasilkan Sumber Daya Manusia (SDM) yang siap menghadapi bencana di Kabupaten Bantul dengan memanfaatkan ICT yang telah terintegrasi dengan sistem informasi pemerintah. Temuan ini berguna untuk mengetahui bagaimana kerjasama pemerintah dalam mitigasi bencana alam berbasis TIK di Kabupaten Bantul. Metode yang digunakan adalah penelitian kualitatif dengan pendekatan studi kasus. Penelitian ini menggunakan tiga teknik pengumpulan data yaitu dokumentasi, Focus Group Discussion (FGD), dan wawancara online menggunakan media zoom untuk memperoleh data dari responden. Temuan menemukan bahwa dalam pelaksanaan kerjasama pemerintah (BPBD) dan MDMC menggunakan beberapa alat untuk media informasi kebencanaan. Keduanya memiliki komunitas yang dikhususkan untuk media kolaboratif adaptif dengan perkembangan teknologi saat ini. Sehingga mitigasi bencana alam dapat terselenggara dengan cepat dan tepat sesuai dengan tingkat kewaspadaan bencana di daerahnya masing-masing.

Kata Kunci: Kolaborasi Pemerintah, Manajemen Bencana, Teknologi

INTRODUCTION

Concerning disaster management, the international community has agreed on disaster management as a top priority. Sendai Framework for Disaster Risk Reduction 2015-2030 (The Sendai Framework for Disaster Risk Reduction 2015-2030) has also formulated 4 priorities of governments around the world in managing and reducing disaster risk, among others: 1) Understanding disaster risk; 2) Strengthening capacity in disaster risk management to reduce disaster risk; 3) Invest in the reduction of plans and resilience to them; and 4) Improving disaster preparedness for effective response, and rebuilding 'Build Back Better' for post-

disaster recovery, rehabilitation and reconstruction (AlHinai, 2020). With the rapid progress and development of technology today making governments around the world to use it in the right action to implement these priorities digitally, this is supported in two points of action on the framework of The Sendai Framework for Disaster Risk Reduction 2015-2030:

"to promote investment in innovation and technological development in long-term, multi-hazard and solution-based research in disaster risk management to address gaps, barriers, interdependence; and social, economy, education, and environmental challenges and disaster risks" (Action K-p.15) and,

"identify research and technology gaps and set recommendations for priority areas of research in disaster risk reduction; promoting and supporting the availability and application of science and technology for decision making" (Action G – p.16)

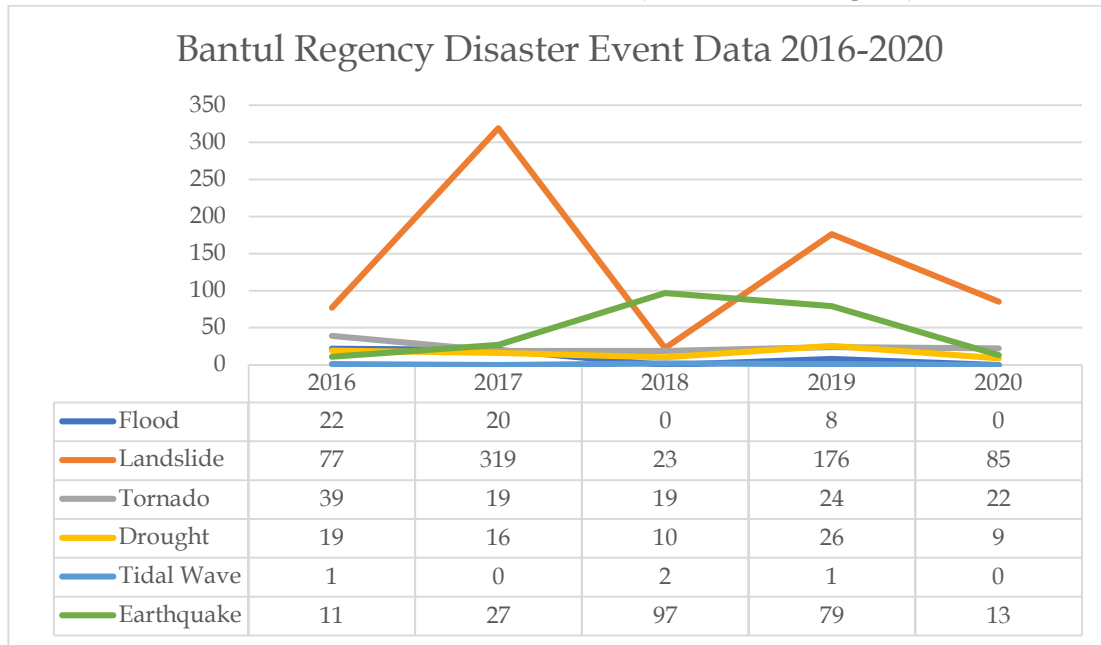
From many findings, the use of technology has helped many parties in disaster risk reduction. Disaster risk reduction has shown a significant increase with the use of technology in it, as well as policies with technology (Tamitiadini et al., 2019), collaboration in the implementation of mitigation (Hegger et al., 2020), and the improvement of Early Warning System technology (Suwaryo et al., 2020). It can be concluded that technology can be an advanced strategy in disaster risk reduction.

In this case, the Government of Indonesia, through Law No. 24 of 2007 Article 44 Paragraphs 1 and 2 has attempted to take swift and appropriate action to reduce the risk of natural disasters and prepare emergency response actions through early warning of disasters with the following stages: 1) Observation of disaster symptoms 2) analysis of disaster observation results 3) decision making by the authorities 4) Dissemination of information about disaster warnings 5) Action taking by the public. Aiming at The Sendai Framework for Disaster Risk Reduction 2015-2030 and Law No. 24 of 2007, the mission to realize good disaster governance ideally needs to involve Information and Communication Technology (ICT) in disaster risk reduction that works to streamline the five stages, especially at the local level.

As a public sector organization responsible for the governance of nencana at the regional level, the Bantul District Disaster Management Agency (BPBD) is in charge of disaster governance agencies responsible for conducting disaster governance at the local level, which was established under Bantul District Regulation No. 06 of 2010 concerning the establishment of the Organization of Regional Disaster Management Agency (BPBD) Bantul regency.

Graph 1 Data on Disaster Events in Bantul Regency in 2016-2020

Source: One Data Bantul (data.Bantulkab.go.id)



Based on Indonesia Disaster Information Data Bantul Regency from 2016 to 2020, 1.164 natural disasters occur in Bantul Regency. Such disasters include floods, landslides, twisters, droughts, tidal waves, and earthquakes. With these data, it means that Bantul district is very prone to natural disasters. With the increasing frequency of disasters in an area, the strengthening of community preparedness faces its own challenges for the occurrence of potential disasters in the future. With the many positive impacts of ICT involvement in disaster governance, efforts to increase community preparedness capacity through ICT also need to be taken into account as a more advanced follow-up effort (Noviardi, 2018). ICT which with the basis of the Internet of Things technology, serves as a tool for sensors to retrieve data, monitor environmental changes for decision making, early warning, and disaster evacuation process (Rauniyar et al., 2017).

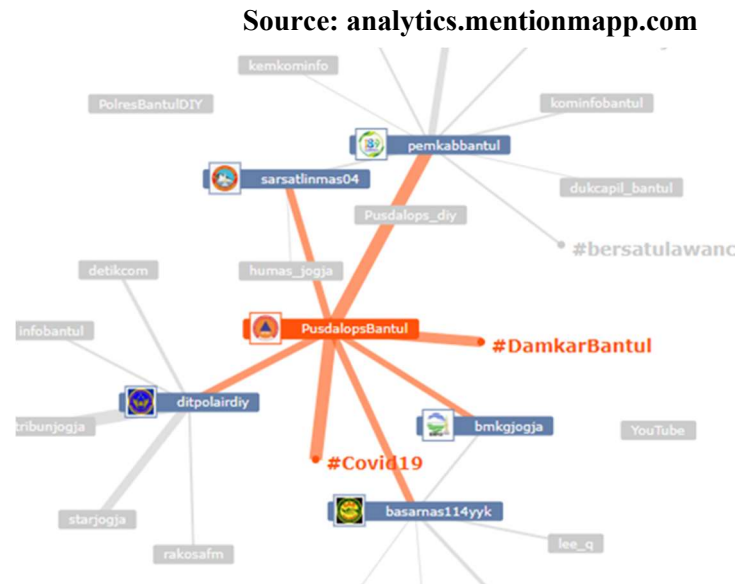
The geographical location of Bantul District From the review of the Regional Disaster Management Agency (BPBD) of Bantul Regency noted that Bantul Regency is included in the red zone prone to disasters. Data obtained from the Indonesia Disaster Risk Index (IRBI) in 2020 also showed that the Bantul District Disaster Risk Index reached a score of 187.2 from the highest index limit of 144 points, which means that this area is very disaster-prone (Sesa Wiguna, Syauqi, 2021). In this index, the level of disaster is assessed from its constituent components, namely the danger, exposure, and capacity of the government and the community in the face of a disaster.

BPBD Bantul regency has made various efforts in improving community preparedness in natural disasters, among others (Daryanto, 2020): 1) Disasters involving the

Government, Private, Community, and Early Warning System; 2) All villages in Tsunami Prone Zone 1 are formed with "Disaster Resilient Village"; 3) Develop tsunami contingency plans at village, sub-district, and district levels; 4) Tsunami Testing early warning system; 5) Participatory Evacuation Preparation; and 6) Evacuation Signs to the last temporary evacuation site. However, in the same way with the development of the internet in the world that has covered 90% of the world (GSM Association, 2020), to make preparedness effective, there needs to be involvement of technology in it. Therefore, technology-based BPBD capacity building is required for disaster risk reduction. Substantially, preparedness is an investment in disaster risk reduction in the future (Healy & Malhotra, 2009).

Based on the Strategic Plan (Strategic Plan 2016-2021) (BPBD Kabupaten Bantul, 2016) has mapped that the role of ICT in disaster mitigation is very important to do. The plan also mentions that cultural collaboration and ICT are very important in realizing an effective preparedness system.

Figure 1 @pusdalopsBantul information coverage data (2020)



The need for information and communication systems in an institution is responded well by BPBD Bantul Regency. BPBD Bantul district is quite active in providing information about disasters on social media than other districts in DIY province. The information that has been uploaded by the Center for Control of disaster Countermeasures Operations (Pusdalops) Bantul has included at least more than 10,000 internet users in Bantul District (Mention App, 2020). So that the information can be one of the disaster mitigation in Bantul Regency. The need for the internet as one of the primary information needs shows that people become all digital in finding out the development of information.

Information and Communication Technology constantly collaborates with Non-Government Organization (NGO), mass media, and other mainstream media. Muhammadiyah

Disaster Management Center (MDMC) as one of the NGOs collaborating with the government contributed a lot to disaster risk reduction. For example, in the study (Suwaryo et al., 2020), MDMC has cooperated and initiated an Early Warning System (EWS) to inform the public in advance of disaster warnings. Kebencanaan also requires advanced technology in the process. MDMC has programs to improve the disaster management system, develop disaster awareness in Muhammadiyah environment, and strengthen network and community participation in disaster management. The MDMC program is also in line with efforts to improve community preparedness in the face of natural disasters BPBD Bantul Regency. Referring to the BPBD Priority Program of Bantul Regency, in the strengthening section of the regional disaster management agency, number 2 mentions a need to develop disaster management information technology.

The study of Government Collaboration that is basically an effort made by the government by directly involving parties involved outside the government order, oriented consensus, and using deliberation in making a decision collectively aimed at making and also implementing public policies and public programs (Ansell & Gash, 2008). This means that the concept of Government Collaboration requires the establishment of a social justice in the fulfillment of public needs. Collaborative governance can be considered as a cooperation relationship between the government as a regulator and the private sector as the implementing party (Donahue et al., 2013). The important elements in the successful collaboration of government (Sullivan et al., 2019) include; the existence of common interests among actors, the perception that the slowness of information is a disaster, being inclusive with other actors, openness of ideas, the belief that problems cannot be solved alone, flexible institutions, the desire to continuously improve communication, and build trust between one another.

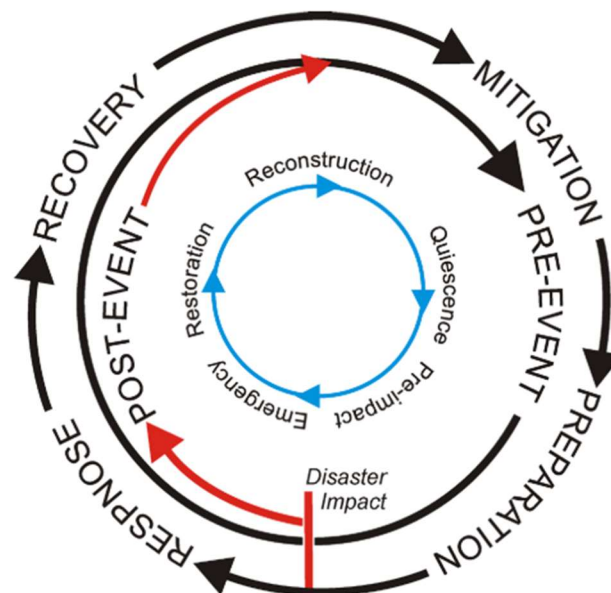
Government collaboration refers to disaster mitigation in the view (Tamitiadini et al., 2019) that long-term mitigation policies are structural and non-structural. Structural here involves a technological, and non-structural approach through legislation and regional planning. For example, general planning and spatial policies to prevent flooding. BPBD and MDMC Bantul here involve a technological approach in every application of disaster mitigation. ICT can be used as a means of simulation and reproducing and public perception of the system in order to propose what actions are appropriate to deal with disasters (Bruzzone et al., 2015).

The concept of Smart Disaster Management is also supported by (Moulik, S., Misra, S., & Obaidat, 2015) with smart-evac concept to speed up the evacuation process with the use of big data. The use of such technology is effective and efficient in handling disaster cases from pre- to post-disaster. Mercer's research in (Wardyaningrum, 2014) also suggests that his research that is poured in the form of volcanic maps can not be understood by the community, so there needs to be communication tools that can be understood by the community in efforts to mitigate natural disasters. ICT development must be made with cooperation between the community and professionals who understand the local community in order to provide disaster risk reduction benefits. The Internet of Things (IoT) in disaster risk reduction applications embraces early warning that has been integrated with installed tools, then analyzes environmental changes and provides data for decision-making needs in disaster mitigation.

Wireless Sensor Network technology can be used as an observation of disaster symptoms. So that decisions can be quickly taken and disseminated through applications that have been downloaded by the public (Noviardi, 2018). (Sikder et al., 2017) also mentioned that they propose smart disaster management by using Information and Communication Technology (ICT) in mitigation in disaster prone areas. ICT can be used as a means of simulation and reproducing and public perception of the system in order to propose what actions are appropriate to deal with disasters (Bruzzone et al., 2015).

Figure 2 Four phases of disaster management

Source: (Herold & Sawada, 2012)



The status of Bantul Regency which is very prone to disasters needs appropriate action and approach to the community to reduce the risk of disaster. Referring to the four phases of disaster management, namely the mitigation phase, the preparation phase, the response phase, and the recovery phase, disaster risk reduction in this study goes into the mitigation and preparedness phase. Because with the use of existing technology, disaster risk reduction activities and processes can be seen from how the role of BPBD Bantul and MDMC in reducing disaster risk by using ICT approach in it.

Based on the background that has been submitted, this research aims to find out how technology and disaster management in Bantul Regency, as well as see how the collaboration between BPBD Bantul and MDMC in utilizing the technology owned. The thesis of this research is in government collaboration in ICT-based disaster management. Moreover, many of the research only looked directly at the management side to the community from the socialization carried out to the policies taken by the stakeholders. So that this research can be

used as an update on ICT-based disaster mitigation that is directly to the public as the recipient of information about disasters. Location determination is based on data obtained in BPBD Bantul regency and index from InaRisk in 2020. It is also related to improving communication patterns of governments and NGOs in disaster risk reduction through Smart Disaster Mitigation.

RESEARCH METHOD

This research is qualitative research with case study approach (Fryer, 2006). The selection of approaches in this study was chosen because of the many uses of technology used by BPBD Kab. Bantul. Qualitative research examines the law documents and related regulations as well as focus group discussion (FGD) and interviews with respondents (Kamberelis, G., & Dimitriadis, 2011), It is related to research questions in the background.

This study uses three data collection techniques, namely documentation study, Focus Group Discussion (FGD), and interview. Documentation methods are carried out to obtain data related to disaster law and regulations on government collaboration in natural disaster mitigation, FGD and Interviews conducted to obtain data from respondents. Respondents to this study consisted of the Regional Disaster Management Agency (BPBD) Bantul Regency, Muhammadiyah Disaster Management Center (MDMC) and communities / NGOs in the field of disaster. The location of this study is in Bantul Regency. The location of Bantul Regency is based on data obtained in BPBD Bantul regency and index from InaRisk in 2019. It is also related to the improvement of ICT by the government and NGOs in disaster risk reduction through Smart Disaster Mitigation.

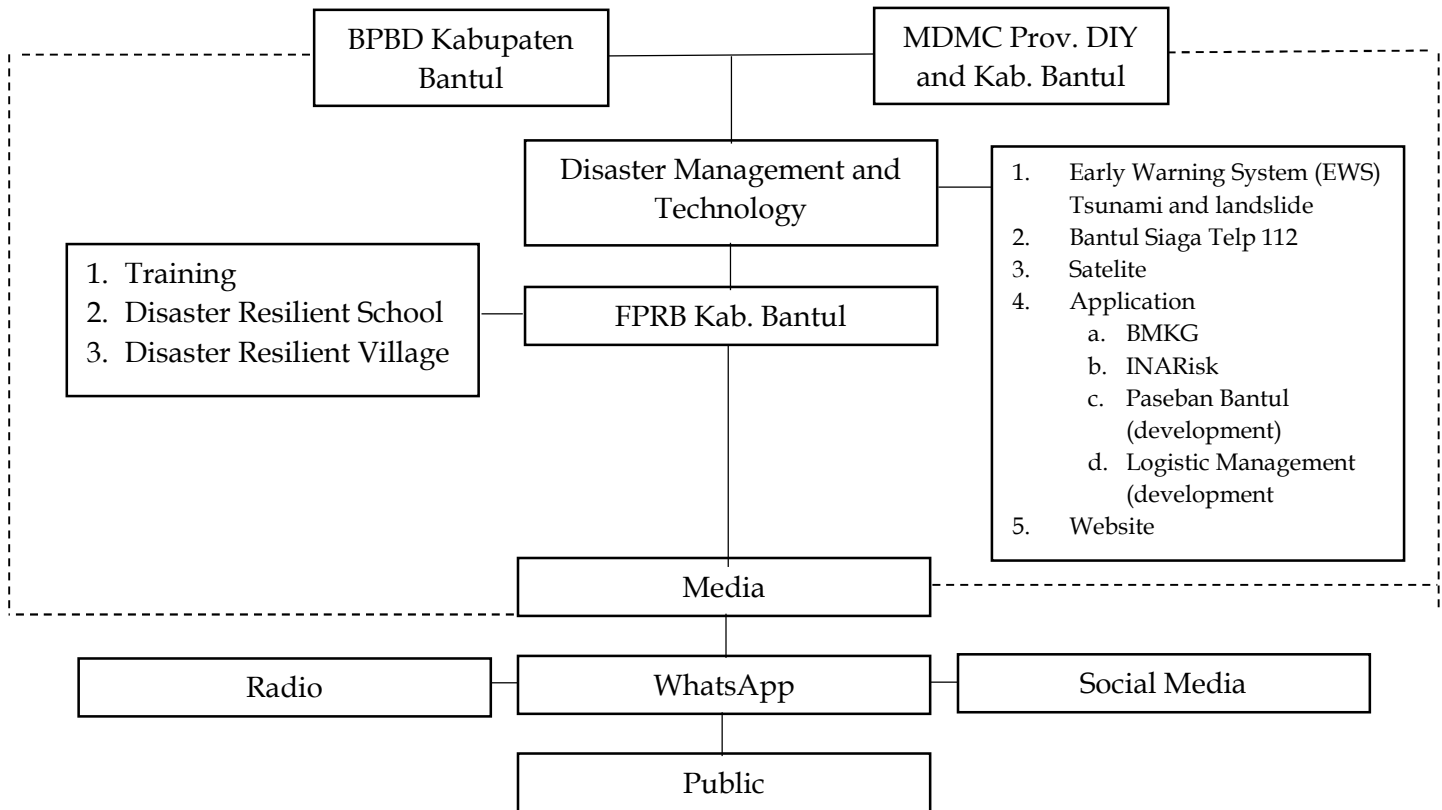
Qualitative data analysis that has been collected will be analyzed using descriptive analysis of FGD results and online interviews through Zoom meeting to provide in-depth analysis of the results of field research that has been conducted (Al-Hamdi et al., 2020). The selection of descriptive analysis is based on the process of collaboration, strategy, to implementation in ict-based natural disaster mitigation.

RESULT AND DISCUSSION

The study of government collaboration in disaster risk reduction through ICT has presented positive results. Included in this study, which discussed the collaboration between BPBD and MDMC in Bantul Regency. The results of the research on the collaboration made FPRB as a means of disaster mitigation based on ICT.

Figure 3 Collaboration between BPBD Bantul and MDMC Prov. DIY and MDMC Kab. Bantul

Source: Research Data



Based on the Strategic Plan (Renstra) (BPBD Kabupaten Bantul, 2016) has mapped that the role of ICT in disaster mitigation is very important to do. The plan also mentions that cultural collaboration and ICT are very important in realizing an effective preparedness system. So BPBD as the official person in charge of regional disaster management has an obligation to regulate and increase disaster risk reduction, especially ICT as a means of information media. While MDMC has a role to help communities and governments in disaster risk reduction hammering volunteerism and socialization in disaster mitigation. The two institutions have collaborated in the field, especially to the FPRB as a community that is active in disaster risk reduction. FPRB is trained to provide information and responsiveness in disaster mitigation in each region. The information obtained by the FPRB and some ICT owned by the government is directly disseminated into public information disseminated through radio, WhatsApp, and social media. Some things about the collaboration are explained in the following 3 points.

1. Government and MDMC Collaboration in Disaster Mitigation

Based on disaster management policy referring to Law No. 24 of 2007 on Disaster Management, Regional Disaster Management Plan (RPBD) of Yogyakarta Special Region in

2013-2017 with Governor Regulation of DIY No. 81 of 2013. Regional Disaster Management Plan is a planning document containing strategies, programs and action options in the implementation of disaster management from the pre-disaster, emergency response, and post-disaster (peraturan.bpk.go.id) stage. In the governor's regulation also explains the vision of DIY disaster management, namely:

"People of Yogyakarta Special Region who are Sensitive, Responsive, and Resilient to Disasters in Meeting New Civilizations" (Governor of DIY Regulation No. 81 of 2013)

The above rules uphold the principle of: 1) Fast and Precise; 2) Effective and Effective; 3) Transparency and Accountability; 4) Partnership; 5) Empowerment; 6) Non-Discriminatory; and 7) Non-Proletisi. These principles represent that disaster mitigation must be collaborative in order for disaster mitigation cohesion to run well.

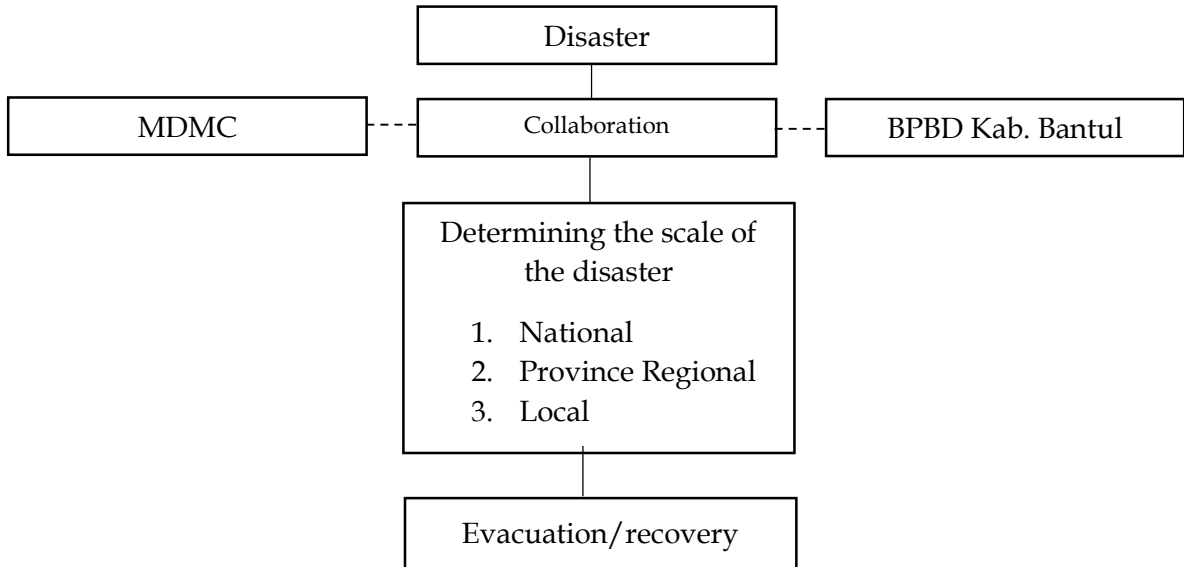
Disaster mitigation is a demand for areas that have low to high levels of disaster insecurity. So, in real terms that disaster mitigation is an obligation in every development sector (Senzaki, 2019). In this case, Bantul district with many types of disasters creates a collaborative system whose function is to improve U.S. Human Resources (HR) capacity to reduce disaster risk. Bantul Government represented by the Regional Disaster Management Agency (BPBD) Bantul regency is also actively conducting mitigation with various means of information and communication technology. These resources are indispensable in collaborative systems in an effort to reduce disaster risk by facilitated access to financial, technical, and human resources exchanges (Goldsmith, S., & Kettl, 2009).

BPBD Bantul regency has formed 35 Disaster Resilient Villages (Destana) whose function is a container for micro-scale disaster risk reduction carried out by the village community itself. In its training, BPBD Bantul regency involves Muhammadiyah Disaster Management Centre (MDMC), which also participates in the trainings conducted from BPBD and MDMC. This is following the concept of access to anywhere (Access to Resource) in government collaboration. In fact, before the existence of Destana as a form of public awareness about disasters in the village, the Disaster Risk Reduction Forum (FPRB) was born first. It became a platform for Disaster Risk Reduction, especially in DIY on October 24, 2009. The establishment of this FPRB then became part of the National Platform for Disaster Risk Reduction (Planas PRB) (Bencanapedia, 2020)

FPRB itself is also inseparable from the role of MDMC in disaster risk reduction efforts in Bantul Regency. MDMC which was formerly designated as a Disaster Management Center (PPB) which was later inaugurated to coordinate all Muhammadiyah resources in every disaster management activity by the Central Leadership of Muhammadiyah after Muktamar in 2010.

Figure 4 Step One Muhammadiyah One Response in the response phase to disaster evacuation

Source: Research Data



In its implementation in DIY, MDMC applies the principle of One Muhammadiyah One Response. When a disaster occurs, it must see the scale of the disaster as National, Regional, or Regional. This is done so that there is no overlap of responsibilities between MDMC and BPBD Bantul Regency. Referring to the DIY Disaster Management Principle, namely the need for speed and accuracy in reducing disaster risk, BPBD Bantul, MDMC DIY up to MDMC Bantul are very collaborative in responding to disaster risk reduction in Bantul Regency.

The process of conveying information by the public can be responded quickly through Pusdalops, which oversees managing disaster management information and communication systems. These reports are also reported by the FPRB to BPBD and MDMC through the WhatsApp Group application created by BPBD and through a predetermined radio channel so that the evacuation or disaster management process can be immediately carried out correctly. The use of media such as Handy Talky through radio and telephone channels is still used to avoid network problems arising from disasters. This form of response is done so that decision-making by stakeholders can be implemented as soon as possible. Collaboration conducted by BPBD Bantul and MDMC has found a meeting point in the reduction of ICT-based disaster risk. With the FPRB as a medium in teaching disaster risk reduction based on ICT, increased public preparedness in disaster risk reduction can run effectively through media that have been prepared by the government.

Coordination between BPBD Bantul and MDMC is also the most crucial aspect, the more effective coordination will be, the faster the handling will be done (Bahadori et al., 2015). The effectiveness of this coordination is seen from the ability of BPBD Bantul and MDMC in finding sources of information to be the basis of rapid decision-making based on data directly

from the FPRB. Thus, the selection of WhatsApp and Handy Talky media through radio channels is the most appropriate media of information and coordination. The FPRB is a community representative of the community coordinates also using the media.

2. Strategies for Disaster Risk Reduction

The division of authority for natural disaster mitigation in Bantul Regency in collaboration between BPBD and MDMC is undoubtedly carried out by the Bantul Regency government, namely, BPBD Bantul Regency, while for volunteerism and training is widely carried out by MDMC. The tools owned by BPBD (Figure 3), such as EWS, emergency numbers, satellites, applications, to social media, can be utilized as the first source of information in every decision in disaster mitigation. Radio, WhatsApp, and social media still play an essential role in disseminating information between BPBD and MDMC to the public. The usual obstacles present in the event of a disaster (evacuation process) are always in the network condition that is problematic at the time of the disaster. BPBD and MDMC also have solutions so that communication in coordination in the field can continue to run well.

"Reports of disasters are usually reported by phone or via WhatsApp via Bantul district emergency phone"

"with many disaster detection tools, we still do other mitigation if at the time of disaster there are problems such as disconnected telephone networks or power outages, FPRB / Destana in Parangtritis for example, they use sirens in mosques as a means of evacuation information in case of tsunami for example"

(Nugroho, Head of BPBD Preparedness Section of Bantul Regency, December 28, 2020)

And strengthened by Purwadi, Chairman of MDMC DIY.

"Our communication between MDMC and BPBD Bantul directly leads to telecommunication radio, although we have a re-beam radio, and the technology is increasingly sophisticated; still media such as radio is still very effective to use when coordination is precarious in the event of a disaster."

MDMC Logistics Management Application is still in the development stage, but volunteerism and our resources are ready to help in case of disaster" (Purwadi, Chairman of MDMC DIY, February 3, 2021)

MDMC also as a collaboration partner of BPBD Bantul regency in disaster mitigation also made the application "Logistics Management" for transparency of assistance and management of post-disaster needs. The function of the construction of this application to mitigate the risk of logistical shortages at the disaster site and the process of logical deployment will also deploy all volunteers including FPRB, and BPBD Bantul Regency.

In a collaboration between MDMC and BPBD Bantul Regency, there is a human resource exchange program, both from MDMC to BPBD Bantul Regency and vice versa. This program influences improving the quality of each institution in the reduction of ICT-based disaster risk. This collaboration indicates that the trust among the participant (Goldsmith, S.,

& Kettl, 2009) is giving confidence to the public sector to help reduce disaster risk in Bantul District. This trust needs to be present because to achieve effective and sustainable communication. And on the other hand, need to build adequate contact with the application of specific methods so that the community, community, until the government can establish good cooperation in disaster mitigation (Wardyaningrum, 2014). The collaboration conducted by the two institutions is more about teaching, training, and volunteerism in disaster risk reduction in Bantul Regency using ICT as a teaching medium in disaster risk reduction. The implementation of teaching and training also always includes elements of ICT in it, such as the use of applications, social media, and so on. For example, volunteers in FPRB trained by MDMC and BPBD always give directions to download inRisk application so that disaster information can be directly informed to the public.

With many collaborations both in the field to the tools used in disaster mitigation in Bantul District, the use of ICT as material and application in disaster mitigation can be a means of simulation and reproduce public perception of the system to know what actions are appropriate to deal with disasters (Bruzzone et al., 2015).

3. Implementation of Disaster Mitigation Collaboration

In the study (Sosiawan, 2015) suggested that Information and Communication Technology (ICT) is a combination of technology governance and information governance used to achieve the goals of an organization through the use of computers. The relationship between ICT and disaster mitigation is the connection between data, actions, and decisions taken by the person in charge of disaster mitigation. In disaster mitigation, there are four phases of disaster management, namely the mitigation phase, the preparedness phase (preparation), then the response phase (response), and then the recovery phase (recovery) (Herold & Sawada, 2012). These four phases require many supporting elements. One of the supporting elements in BPBD Bantul is Pusdalops Bantul. Disaster Management is an implementing operational element in the Central and Regional Governments tasked with facilitating active control and organizing information and communication systems to the community. This field manages the use of ICT and social media at each phase of the disaster. The main task of Pusdalops in the pre-disaster time by providing support activities at the time before the disaster regularly. When disasters occur, Pusdalops provides support to the Emergency Response Post and the Implementation of Emergency Activities. In the aftermath of the disaster, Pusdalops includes support for activities in the moments after the disaster, such as data and information providers for rehabilitation and reconstruction (BPBD, 2019).

In ICT-based disaster mitigation, BPBD and MDMC have media that include; websites, social media (Instagram, Twitter, Facebook), and InaRisk integrated in Pusdalops Bantul that also provide information about disasters, both from mitigation, what to do, to complaints in case of disaster. Complaints submitted by the public through existing media affect BPBD Bantul and MDMC's digital services because this is in line with digital-based collaboration that prioritizes citizen engagement (Frach et al., 2017)

Table 1.

Table 1 Digital-based information and reporting services BPBD Kab. Bantul and MDMC
Source: research data

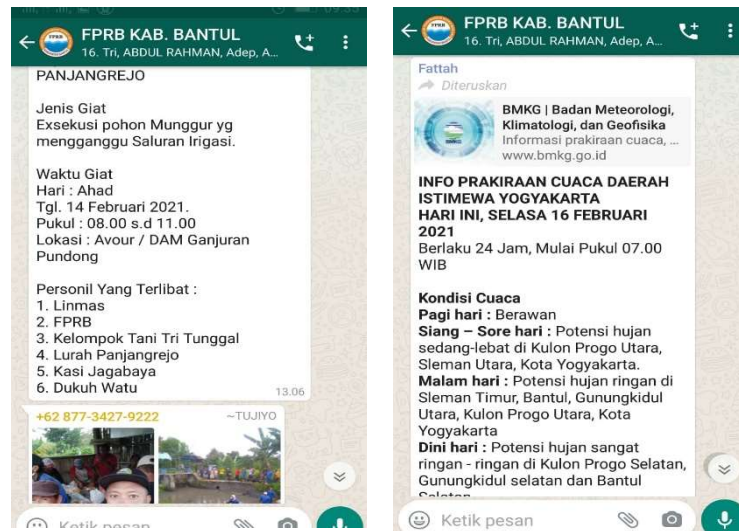
Institution Name	Social Media	Website		Website
	Instagram	Facebook	Twitter	
BPBD Bantul Regency	@pusdalopsBantul	BPBD Bantul Regency	Pusdalops Bantul	BPBD.Bantulkab.go.id
MDMC	@MDMCIndonesia	MDMC Indonesia	MDMCIndonesia	MDMC.or.id

Of all the media owned by the two agencies, all pinned a 24-hour Call Center for the community if there is a disaster. This is very helpful if there is an area of disaster and immediately reported through the existing call center. This is justified by the FPRB of Bantul Regency:

"If the application in Bantul already exists 112, so if we want to call 112 then it has been integrated with everything" (Budi, Vice Chairman of FPRB Bantul, March 2, 2021)

The Bantul district government has cooperated with the Ministry of Communication and Information (Kominfo) with a one-door telephone for all problems that exist through #Bantulsiaga112 with number 112 that has been integrated with all relevant stakeholders regarding the problems experienced by the community. Especially disaster, phone 112 will be directly integrated with Pusdalops Bantul and will immediately complete the existing report. In interviews with BPBD and MDMC, community complaints about disasters have been integrated through fprb groups in Bantul district to continuously monitor the situation, reports, and actions.

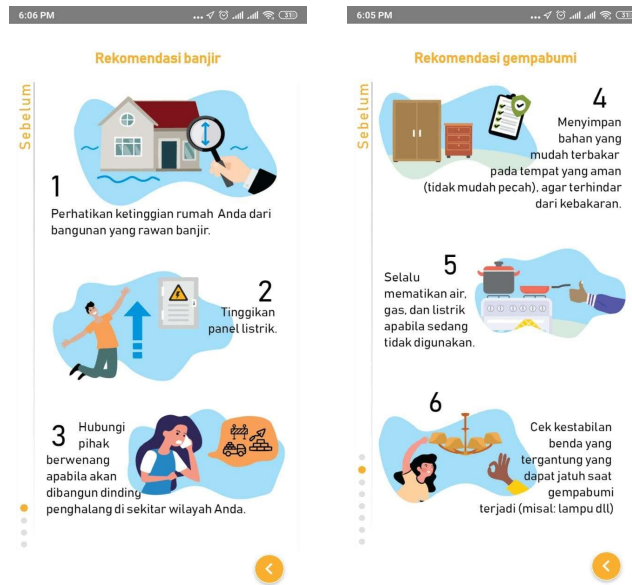
Figure 5 Information via WhatsApp group FPRB Bantul
Source: Interview Data



To improve preparedness, BPBD Bantul and MDMC districts still adopt technology such as Radio (UHF, VHF, and HF) through Handy Talky (HT) that has been determined by the channel so that the delivery of information is quickly delivered. This is done for prevention if the internet and electricity are experiencing problems during a disaster. Like in Parangtritis sub-district, which has tsunami risk, FPRB, BPBD, and MDMC continue to provide intensive training and attention. Every 26th, an Early Warning System warning siren is sounded to check its function. FPRB as a disaster risk reduction community also contributes to disseminating EWS information through mosques in Parangtritis Sub-district to be directly distributed to the community.

Based on the media used as an information and reporting media, it can be concluded that the media used by BPBD Bantul and MDMC are included in the new media. This is in line with (Baran, 2015) which explains that the characteristics of the new medium are; 1) two-way communication; 2) interactive; 3) conferences (producers and consumers) at the same time. As for the old media, the characteristics are; 1) institutional; 2) one-way communication; and 3) the strength of the institution.

Figure 6 InaRisk application used as a mitigation media to the community



For the use of applications, BPBD and MDMC both provide direction to the community to use the InaRisk application as a medium of disaster mitigation by the community. Because in this application, the data obtained by various sources is processed into a sophisticated disaster mitigation application. InaRisk was launched in 2016 by BNPB to assist the Government, Local Government and parties in developing strategies for the implementation of programs, policies, and activities to reduce disaster risk at the national to regional levels.

In the implementation of collaboration in disaster risk reduction has shown the existence of sharing information between BPBD and MDMC. This is demonstrated by the ease of access to information with the use of media that has been owned by fprb, BPBD Bantul, and MDMC. However, on access to resources, the collaboration between BPBD Bantul and MDMC has no access to the budget for disaster risk reduction activities because there is no legality in writing about cooperation between the two institutions. In fact, access to these resources is essential for the ongoing collaboration between government and private sector to achieve the common goal (Goldsmith, S., & Kettl, 2009).

CONCLUSION

BPBD Bantul MDMC has shown active collaboration in disaster risk reduction in Bantul Regency. Disaster information reported daily to the WhatsApp group of Disaster Risk Reduction Forum in Bantul District is passed into data to the center and reprocessed into data reported to the public through social media. The application of ICT commonly used by the FPRB today can be a solution in disaster risk reduction because people are used to using these facilities.

However, along with the many disaster events in Bantul Regency, there needs to be an increase in human resources capacity, early detection tools, application rejuvenation for

disaster risk reduction, and an adequate budget to provide a positive impact in improving disaster mitigation in Bantul Regency. To increase cooperation between BPBD Bantul and MDMC, there needs to be written legality so that efforts in disaster risk reduction can obtain better budget resources, information, and services and clarify the authority and responsibilities of each institution.

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