Training of dual band HT-based emergency communication tools on member of KTB BPBD, yogyakarta

Denny Hardiyanto\textsuperscript{a,1}, Samuel Kristiyana\textsuperscript{b,2}, Dyah Anggun Sartika\textsuperscript{c,3}, Irfan Ahmad\textsuperscript{d,4}, Israa Al_Barazanchi\textsuperscript{e,5}

\textsuperscript{a} Electrical Engineering Education, Universitas PGRI Madiun, Madiun, Indonesia
\textsuperscript{b} Electrical Engineering, Institut Sains dan Teknologi AKPRIND Yogyakarta, Yogyakarta, Indonesia
\textsuperscript{c} Computer Control Engineering, Politeknik Negeri Madiun, Madiun, Indonesia
\textsuperscript{d} Department of Computer Science, Khurasan University, Nangarhar, Afghanistan
\textsuperscript{e} College of Computing and Informatics, Universiti Tenaga Nasional (UNITEN), Malaysia

\textsuperscript{1} denny.hardiyanto@unipma.ac.id; \textsuperscript{2} yanaista@akprind.ac.id; \textsuperscript{3} dyahanggun@pnm.ac.id; \textsuperscript{4} irfan.ahmed.mcse
\textsuperscript{5} israa.abarazanchi@baghdadcollege.edu.iq

\textsuperscript{*} Corresponding Author

ABSTRACT

Currently, the development of communication technology is very advanced with the presence of cellular and internet technology. However, when there is a public security disturbance and in an emergency situation, cellular communication devices are very dependent on electricity sources and pulses to communicate. Besides, if a natural disaster occurs, the power source will go out and the cellular provider BTS will not function. Radio communication can be used as an adequate alternative technology in dealing with emergencies. Radio communication can be established using simple equipment such as HT (Hand Transceiver), transmitting antennas and repeater stations to extend the communication range. The advantages of radio communication are that it is easier to implement, economical, and has a wide coverage. Therefore, the purpose of this community service activity is to improve skills in using emergency communication tools and provide an understanding of Standard Operating Procedures on how to communicate in an emergency situation. The target of this activity includes members of the National Disaster Relief Agency (BPBD) at Yogyakarta City. There are 2 activities, namely radio frequency regulation and skills workshops using emergency communication tools (HT). The result of this community service activity is that the participants are skilled in communicating using HT in times of emergency.

KEYWORDS
Disaster; Hand Transceiver; Radio Communication; BPBD DIY

1. Introduction

Community security and order (kamtibmas) is very important in people’s lives for a safe and comfortable life. Disaster preparedness is also a thing that supports a peaceful life because of the readiness of every family member in responding to and aware of their own readiness in dealing with disasters that come at an unknown time. This is considering the location of the province of Yogyakarta which is prone to disasters, namely Earthquake, Merapi Eruption, Tsunami, Landslide, Tornado, etc. Several previous researchers have conducted research on disaster preparedness. Data on knowledge management and natural disaster preparedness: Field survey in East Lombok, Indonesia researched by Arviandasyah [1]. Public perceptions of climate change and disaster preparedness: Evidence from the Philippines researched by Bollettino [2]. Indonesian nurses’ perceptions of disaster preparedness were investigated by Martono [3]. Modeling predictors of earthquake hazard preparedness in Nepal was investigated by Adhikari [4]. Risk factors for COVID-19: A peculiar case of African governance and preparedness studied by Kulohoma [5].

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DOI: https://doi.org/10.59247/jppmi.v12i2.6
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Structured, fast and dynamic communication is very helpful for the community in dealing with disturbances in security, order and natural disasters. Radio communication can be used as an alternative technology that is quite adequate in dealing with emergencies such as disasters where the power source goes out and the BTS source goes out. Radio communications can be established using simple equipment such as Hand Transceivers, aluminum transmitting antennas and simple stations to extend the communication range. Several previous researchers have conducted research on radio communication. Measurement and prediction of large-scale radio propagation path losses in the VHF and UHF bands were studied by Faruk [21]. Vulnerability related to disaster communication: A heuristic framework was investigated by [22]. The Algorithm Solution for the RFID Tag Anti Collision Problem in Supply Chain Management was investigated by Pal [23]. The program and circuit design of the FSK radio simple software circuit based on the MCU was investigated by ZhongKai [24]. A local algorithm for clustering in cognitive radio networks was investigated by Kumar [25]. Multimedia communication over cognitive radio networks from a QoS/QoE perspective: A comprehensive survey was investigated by Jalil [26]. The investigation of the performance of different pathloss models for wireless communication systems in Nigeria was investigated by Igbinosa [27].

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Comparative study of Radio Refraction Gradient in the troposphere using Chaotic Quantifiers was investigated by Ojo [59]. Strengthening the Learning Spectrum Management Paradigm in Cognitive Radio using Novel State and Action Sets researched by Yin [60]. From the problem of radio communication has advantages such as easier to implement, economical, and wide coverage. Therefore, the contribution of this community service activity is to improve skills in using communication tools and provide an understanding of SOPs on how to communicate in an emergency. In addition, in the event of a natural disaster, the power source will be cut off and the cellular provider BTS will not function. Circumstances like that make the need for a power source very necessary. In this case, the electricity source from PLN cannot cover this need because the power source goes out. Therefore, we need an alternative system/technology that can be used for telecommunications systems during an emergency.

2. Method

This community service activity is carried out in collaboration between institutions/universities and the Yogyakarta City Regional Disaster Management Agency (BPBD). Expert instructors for this activity come from lecturers from various institutions who have expertise in the field of communication. The targets of this community service activity are members of the KTB (Disaster Resilience Village), members of the Yogyakarta City BPBD, Pusdalop, and TCR with a number of participants reaching 50 people and carried out at Wisma Sarged, Yogyakarta City before the pandemic. As a member of the BPBD, he has an important role in serving the community, especially in the event of a disaster situation and is always
alert and responsive in carrying out his duties. BPBD members must be equipped with a lot of insight and special skills in dealing with disasters (kamitbmas). The implementation of this activity includes 2 activities, namely regulatory material and radio frequency permits [61][62] and skills workshops using a Dual Band hand transceiver (HT) communication tool, how to set up HT and the use of repeater stations [63][64]. The details of the implementation stages are shown in Fig. 1.

![Implementation stages](image)

**Fig. 1.** Implementation stages

Activity 1 is carried out in one day which contains explanations of basic materials on communication, regulation and radio frequency licenses. Furthermore, activity 2 was carried out in 2 consecutive days, namely a communication skills workshop which included setting up a Dual Band Hand Transceiver communication device and simulating communication using a repeater station in case of an emergency.

### 3. Results and Discussion

A member of the kamitbmas and a member of the Regional Disaster Management Agency (BPBD) must have special expertise in dealing with various emergency situations. Therefore, various skills, especially communication skills and understanding proper communication SOPs, must always be improved. The result or outcome of this activity is an increase in the skills of participants in using emergency communication tools, namely Hand Transceiver (HT) Dual Band and understanding the SOP for proper communication when an emergency occurs. Participants gain expertise and knowledge about communication tools from the workshop activities that are carried out and simultaneously conduct communication simulations between members using repeaters. The result of achieving activity 1 is that participants understand government regulations related to the use of radio frequencies. In this case, the PKM team presented and discussed materials related to the basics of radio communication and radio frequency licenses. Activity photos are shown in Fig. 2.

![Radio communication basic material activities](image)

**Fig. 2.** Radio communication basic material activities

Activity 2 is a communication training workshop using HT Dual band. Before conducting a communication simulation, participants are required to set their respective HT in the settings feature is
shown in Fig. 3. Assisted by the instructor, participants followed the method of setting the HT according to the frequency used is shown Fig. 4.

Fig. 3. How to set up hand transceiver

As for setting up HT, there are several things that must be considered, namely the introduction of buttons on HT, terms that are often used in HT (including: TX, RX, VHF, UHF, Duplex). In the workshop, 3 different frequencies were used. For KTB BPD DIY participants, they must be able to adjust the frequency on the HT for practice using the RX frequency: 169,635 MHz, TX: 164,635 MHz, Duplex (-) 5,000, Tone 88.5. For Pusdalop members, the frequency is RX: 169,525 MHz, TX: 164,525 MHz, Duplex (-) 5,000, Tone 88.5. Meanwhile, the Direct/Simplex exercise frequency uses RX/TX 165,000 MHz.

Fig. 4. Workshop of antenna installation and hand transceiver setup

The result of this workshop activity is that the participants are competent/skilled in communicating using HT Dual Band. Then to facilitate communication and the next step is to create a communication logbook for members of KTB BPBD DIY is shown in Fig. 5.
Fig. 5 is communication logbook. This logbook will then be used by each participant in carrying out daily activities to support smooth communication when carrying out their duties as BPBD members.

4. Conclusion

The conclusion that can be given is that the members of KTB BPBD DIY as participants in the activity are very enthusiastic about the communication skills workshop. The participants of the activity were very excited to immediately compile and build a communication system at the village level. The KTB organization immediately made a rolcall communication system for directed calls on every working day guided from the Yogyakarta City BPBD office.

Acknowledgment

Our gratitude goes to the members of the Yogyakarta City Regional Disaster Management Agency (BPBD), Gadjah Mada University, IST AKPRIND Yogyakarta, UNIPMA, and PNM for their full support in implementing this community service activity.

Author Contribution

This community service activity is carried out in collaboration between institutions/universities and the Yogyakarta City Regional Disaster Management Agency (BPBD).

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Conflict of Interest

The authors declare no conflict of interest.

References


