

## The Role of Stakeholders in Flood Management: Study at Ponorogo, Indonesia

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### ABSTRACT

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*The knowledge of stakeholders role is important to determine the recommendations of flood management. So that the purpose of this study is to analyze the role of each stakeholder in flood management at Ponorogo, Indonesia. The stakeholders include Government, non-governmental organizations (NGOs), academics, and the local community. This research used the descriptive qualitative method by using survey method. The data were collected through observations, interviews, questionnaires, and documentations. The coordinator in flood management is Regional Disaster Management Agency. The jobs of Regional Disaster Management Agency are to coordinate all of the stakeholders in each step of flood management, which consists of pre disaster, disaster and post disaster. Pre disaster is a step of flood management which consists of flood mitigation and early warning system. In the disaster phase, the stakeholders collaborate in emergency responses and will be coordinated by Regional Disaster Management Agency. Whereas in the post disaster phase, the Regional Disaster Management Agency will coordinate the related stakeholders to rehabilitate and reconstruct the damage of existing infrastructure.*

**KEYWORDS:** Stakeholders, Flood Management, Ponogoro, Indonesia

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### I. INTRODUCTION

Flood is one of the most common natural disasters, irrespective of the state of human development and natural conditions. It's impacts affect the physical, economic, social, geographical, psychological, and cultural spheres of human endeavor (Agbola, et al., 2012). The Regulation Number 24/2007 about Disaster Management mentions that there are many kinds of disaster, which one of them is flood. Indonesia is one of a flood vulnerable country. Frequently, flood hits several areas in Indonesia, especially in Java. Suyanto (2008) reports that the type of disasters which is frequently occurred, especially in East Java, are floods and cyclones or hurricanes. This type of disaster occurs only in the rainy season, but the impact will be devastating. Several studies have been conducted to examine more deeply about the causes of flood. Sebastian (2008) suggested that flood can be caused by two factors, natural causes and human activity causes. Natural causes consist of rainfall, physiographic, erosions and sedimentations, river capacity, drainage capacity and the influence of tides. The human activity causes include the changes of watershed conditions, residential areas around the riverbanks, the destruction of land drainage, the damage of flood buildings, the damage of forest, and the bad planning of flood control systems.

Ponorogo is one of the city in Java, Indonesia which is a flood vulnerable area. The huge flood had occurred in Ponorogo at the end of 2007. It's causes are the overflowing of Bengawan Solo river which flows in this area. Heavy rainfall was not accommodated by the river was overflowed so that the river overflowed and flooded the surrounding areas. The huge flood also occurred on February 22<sup>nd</sup>, 2012, which was also caused by high intensity of rainfall. The losses was considerable, such as inundation of some schools, hundreds of public houses in four villages, thousands hectares of farmland, cut off access to the main road between Ponorogo Regency and Pacitan Regency, and the interruption of economic activity (Java Pos Daily, 2012). Considering the magnitude impact of the flood, it is important to consider several efforts to overcome the disaster. The overcome should be based on the examination of the flood main cause that had been known. The overcome effort must involve all of the stakeholders. The decision making consists of different stakeholders, which have a common in finding the source of problems, and have the authority to resolve the existing problems together (Steins and Edwards, 1999; Djalante, 2012).

Stakeholders in a process are actors (person or organizations) with a vested interest in the policy being promoted. These stakeholders can usually be grouped into the following categories: international/donors, national political (legislators, governors), public (ministry of health (MOH), social security agency, ministry of finance), labor (unions, medical associations), commercial/private for-profit, nonprofit (nongovernmental organizations (NGOs), foundations) civil society, and users/consumers (Schmeer, 2008). To overcome the disaster that often occurs in this country, the Government and community have tried to increase the interest and ability in disaster management efforts, especially after the tsunami disaster at the end of 2004 (Maarif, 2010). This research refers to the important of the stakeholders role in flood management. The purpose of this research is to analyze the role of each stakeholder in flood management at Ponorogo. The knowledge of stakeholders role can be used to determine the recommendations in flood management in Ponorogo, involving all of the stakeholders.

## **II. METHODOLOGY**

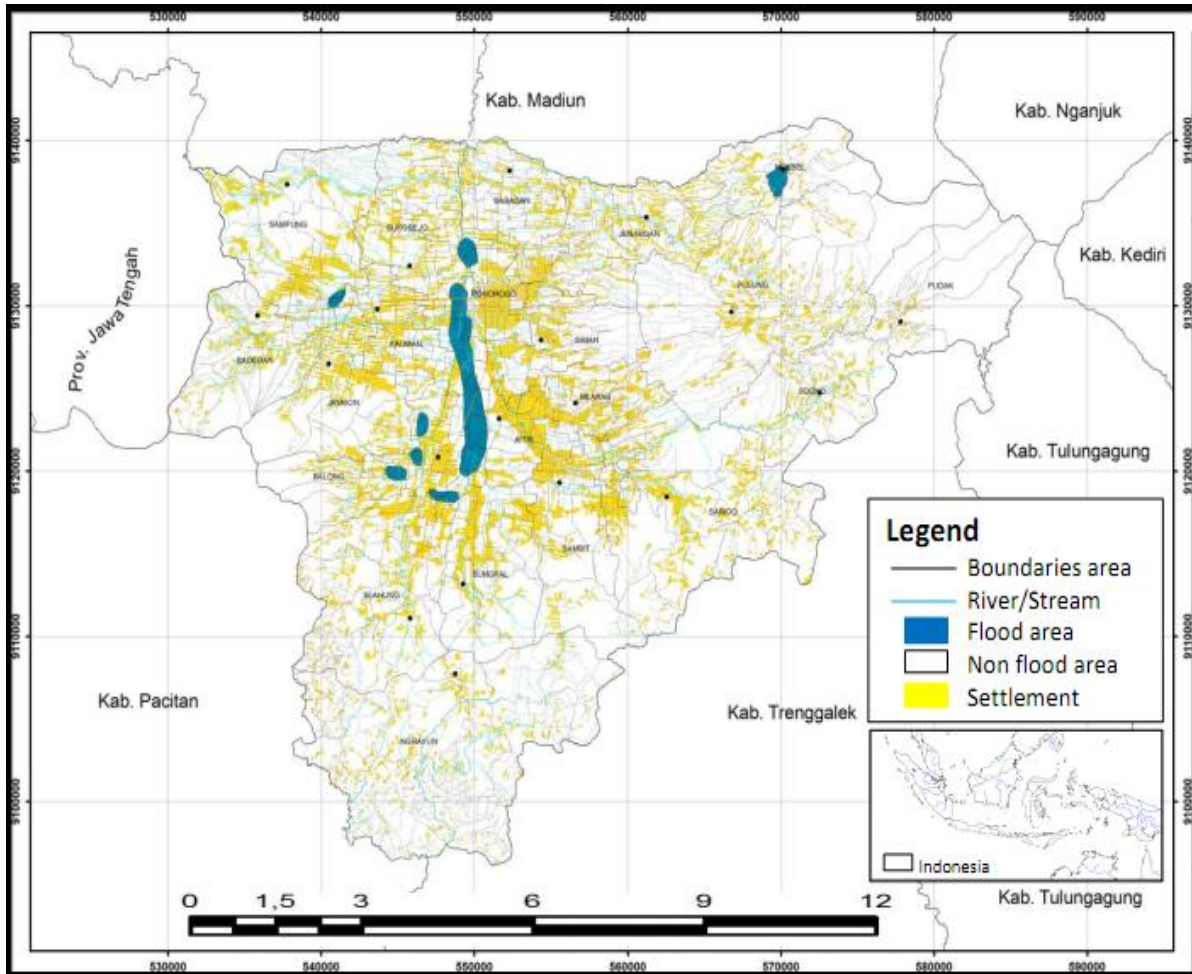
The research was conducted in Ponorogo, and took place the flood-prone location in Ngampel Village. The time of the study was done during December 2012 to January 2013. This research uses the descriptive qualitative method by using survey method. The survey was included on the area condition and the community behavior in managing the area. The data collecting method consist of observations, interviews, questionnaires, and documentations. The sampling techniques are purposive sampling and snowball sampling. The data types used in this research are primary and secondary data. Primary data are obtained by the result of observations, interviews, and questionnaires. Secondary data are obtained from the documents held by the relevant stakeholders. The stakeholders consist of Government, Academics, Non-Governmental Organizations (NGOs) and the local community.

## **III. FINDINGS AND DISCUSSIONS**

### **3.1. Study Area**

Ponorogo is one of the regency in East Java, Indonesia. Ponorogo has an area about 1,317.78 km<sup>2</sup>. It located between 111<sup>0</sup>17' - 111<sup>0</sup>52' east longitude and 7<sup>0</sup>49' - 8<sup>0</sup>20' south latitude with an altitude between 92-2,563 meters above sea level. Ponorogo boundaries are Madiun and Magetan in the north, Pacitan and Wonogiri in the west, Pacitan in the south, and, Tulungagung and Trenggalek in the east (Figure 1.) Geographically, Ponorogo is divided by two sub area, plateau which consist of Ngrayun, Sooko, Pudak, Pulung, and Ngebel, and others are lowland. There are 17 rivers flow in this area through between 4 up to 58 kilometers. Fuction of this river are used to irrigation for farmland. The existing land of Ponorogo consist of forest area, farmland area, and the rest is used to moor, yard, and others. Ponorogo has two seasons, which are rainy and dry seasons. By 2010, average of the highest rainfall occurs in December through 382 mm with the rainy days were 21 days, in August has an average of the lowest rainfall through 38 mm with rainy days were 3 days. Based on The National Social Economic Survey on 2010, the population in Ponorogo on the end of 2010 was decreased about 4,89%. The population density was also decreased from 656 people/km<sup>2</sup> to 623 people/km<sup>2</sup>.

Ngampel Village, which was the research location, is one of the village in Ponorogo. The total area of this village are 290,585 hectares. The boundaries of Ngampel Village are Madusari Village in North, Turi Village in East, Balong Village in South, and Muneng Village in West. Geographically, Ngampel village is located at 110 meters above sea level with a temperature of 28°C and rainfall of 2000 mm/year. The population of Ngampel village on 2011 are 4.117 people. The majority of the population who works as Farmer Entrepreneur are 496 people (50%). The education level of the community who are has not/did not complete the primary school are about 2.272 people (55%).



**Figure 1. Map of Ponorogo, Indonesia, showing the flood area**  
 Source: Public Work Department of Ponorogo, Indonesia, 2012

### 3.2. Flood and Its Impacts

The flood, which is frequently occur in Ngampel village, comes from the overflow of Pelem river, which is the main river flowing in this village. Flood occurs every year in this village. The huge flood occurred in the end of 2007 and flooded again on February, 2012. The flood on 2012, flooded all around the village area. Based on the information from The Head of Ngampel Village, that the flood elevation is  $\pm 1$  meter, and flooded the village during two days. Based on the data from The Regional Disaster Management Agencies of Ponorogo Regency, the flood that occurred on February 23, 2012 in Balong District, had the impact on the damage of buildings which are about 2 houses collapsed and 220 houses were submerged, and the agricultural land submerged about 280 hectares. Flood occurred again on the last of December, 2012 to the early of January, 2013. The losses suffered by the community include the damage of agricultural areas, so that some of them threatened by crop-failure. It is noted down that, agricultural land in Ngampel village which had been hit by flood is about 12 hectares and crop-failure is about 5 hectares.

### 3.3. Role of Stakeholders in Flood Management

The Stakeholders was used as samples in this research consists of Executive, were Environmental Office, Agriculture Department, Regional Planning Agency, Health Department, Public Works Department, also Regional Disaster Management Agency; Legislative, were Regional Parliaments of Ponorogo, which consists of Regulator Field and Commission C; Judiciary were Polices and Prosecutors; Academics were Muhammadiyah University of Ponorogo, National Islamic Academic of Ponorogo and Gontor Modern Boarding School; NGOs was Algehins, and also the local community of Ngampel Village who was the affected community of flood. In management of flood, each stakeholder has role, where it has one purpose is to manage the area, which indirectly also give the impact to decrease the risk of flood. The role of each stakeholder in flood management shows on Table 1. below.

Table 1. The Role of Stakeholders in Flood Management

Number	Stakeholders	Role
1.	Regional Planning Agency	To coordinate the related department in macro regional development
2.	Public Work Department a. Water Resource Field b. Copyrighted Works Field	To manage the water resource, include: determine the rainfall, regulate the water use and its ways, wasted water, and using area below Planning and spatial working
3.	Environmental Office	<ul style="list-style-type: none"> <li>o To coordinate all sectors in environmental management</li> <li>o To compose the programs of planting seeds in watershed</li> <li>o Production the infiltration wells and absorption wells</li> </ul>
4.	Regional Disaster Management Agency	<ul style="list-style-type: none"> <li>o Coordinator in the efforts of disaster management</li> <li>o Executor command of disaster management effort which is consist of pre disaster, emergency responses, and post disaster</li> </ul>
5.	Agriculture Department a. Agriculture Field b. Forestry Field	Provide the seeds in agriculture fields Planning, implementing, and monitoring the forest conservation processes
6.	Health Department	<ul style="list-style-type: none"> <li>o As a rapid response team in emergency response</li> <li>o Coordinator in the efforts of disease prevention and treatment</li> <li>o To record the data of the disaster victims, assistances, and the availability of clean water</li> <li>o Compose The Rapid Health Assessment</li> </ul>
7.	Regional Parliament a. Commission C b. Regulator Field	Physical handling in the efforts of disaster management <ul style="list-style-type: none"> <li>o Budgeting the disaster funds</li> <li>o To establish the regulations of disaster management</li> </ul>
8.	Police	<ul style="list-style-type: none"> <li>o Help the community in emergency response in evacuation processes</li> <li>o Advise The Local Government to curb the building in flood areas</li> <li>o Appeal the community not to plunder the forest through training programs</li> <li>o Monitoring the forest areas</li> </ul>
9.	Prosecutor	<ul style="list-style-type: none"> <li>o Giving the training to the community about environment</li> <li>o Provide the law enforcement for the violators of environmental laws</li> </ul>
10.	Muhammadiyah University	To establish The Spontaneous Teams which is involving the students, the lecturers, and the employees
11.	National Islamic Academic	<ul style="list-style-type: none"> <li>o Spontaneous reliefs from the students, the lecturers, and the employees</li> <li>o To participate in the delivery of volunteers in emergency response</li> </ul>
12.	Gontor Modern Islamic Boarding School	Facilitator in funds submission to The Central Government for the normalization of Pelem River
13.	NGOs Algehins	As a medium for the discussion to initiated the ideas in flood management which is involving all of the community's elements
14.	Local Community	Participate in flood management efforts that have been initiated by The Local Government in the form of power

Source: The Observation Result (2013)

Based on the table, it shows that each of the stakeholders has a relationship with each other in disaster management efforts, which consists of 3 components: pre-disaster, emergency response and post-disaster. The Regional Disaster Management Agency, which has been established since September 2010, has a very important role, which coordinate all of the relevant stakeholders, both in the pre-disaster, emergency response, and post-disaster.

**A. Pre-Disaster Efforts of Flood**

One of the pre-disaster effort of flood is flood prevention efforts. The flood prevention efforts undertaken by The Regional Disaster Management Agency are:

- a) Socialize the procedures of flood prevention efforts to the community
- b) To propose to the relevant agencies, namely the Department of Public Works and Central River Region of The Bengawan Solo river about the river widen efforts, which has a realization in Ngampel Village to The Genteng Bridge along 5 km.

- c) The cooperation with all relevant agencies and The Local Governments, which include: The Regional Planning Agency, The Department of Public Works which consists of The Copyrighted Works Field and The Water Resources Field, The Environmental Office and The Department of Agriculture which consist of The Agricultural Field and Forestry Field. This cooperation is about the region management efforts, which are paying more attention on environmental areas as a flood prevention.
- d) Cooperation with local communities to establish The Disaster Resilient Village, but this program is still not formed for Ngampel Village.
- e)

Environmental Office, which acts as a coordinator in environmental management, has a very important role in preventing flooding disaster, including to control the development area which has been planned and implemented involving The Regional Planning Agency and The Copyrighted Works Field of Public Works Department which have the authority in the regional development planning of Ponorogo. Environmental Office involvement in the development planning of Ponorogo is intended that the planned development based on environmental and sustainable. This concept is intended that the existing development process is not only emphasizes the importance of political, economic and social, but also respect to the environment and sustainable development, so that there is no negative impact on the environmental quality, so later the generations can also enjoy the environment.

The Regional Planning Agency which has the role of coordinating the related agencies in the macro region development, should also pay attention to the rules of the environment in the area development that has been planned. Various issues about the areas development which are related to the environment in Ponorogo, was mentioned in The Medium Term Development Plan of Ponorogo 2010-2015, include:

- a. The low of the infrastructure development quality and quantity in rural and urban
- b. The low of the utilization of forest development that aimed to optimize the ecological and economic benefits, forest and land rehabilitation are needed to reduce the rate of degradation, and the lack of efforts to reduce the pollution and the development of new energy sources that are environmentally friendly.
- c. The low of pollution monitoring and control systems.
- d. The absence of strict sanctions against the illegal miners or the violater of the regulations and the lack of the rehabilitation of mined areas .
- e. There is a shortage of competent and professional human resources as an instrument of the development, and low of the quality and quantity of human resources in mastery of science and technology to promote the accelerated of the development in all fields.

Referring to the problems in the area development which based on environment and sustainable, the Ministry of Environment, as a coordinator of environmental management, has an authorities to tackle the existing problems which was related to the environment. The efforts to overcome these problems, the Ministry of Environment can also cooperate with relevant agencies, namely the Department of Agriculture (Agriculture and Forestry Division), Public Works Department (Water Resources Management Division), the police, prosecutors and NGOs. Department of Agriculture, through the counseling process, can do the counseling to the local community about the area management based on the environment and sustainable. The Division of Agriculture gives the counseling to educate the farmers to do the environmentally friendly farming system to minimize the usage of pesticides and chemical fertilizers so it is not make the degradation of the land. The Division of Forestry gives the counseling to the local community about the importance of forests as a life support so the people take care and participate in the efforts to protect the forest.

Water Resources Management Division of Public Works Department also has an authority in the management of water resources, including built the water infrastructure so the existing water, either water which is flowing in rivers and water stored in the soil, can be maintained and not bring the disaster, both in the rainy season and the dry season. Periodic monitoring of water balance is very important to do to know the availability of water and water usage so the water balance can be maintained. The cooperation between the police and prosecutors is important to do in terms of monitoring and enforcement actions on any legal violations which may harm the environment. Sanctions should be given explicitly and provide a deterrent effect so the violators will not repeat the offense again and those who have violated will not desire to do. The roles of the NGOs are as a discussion medium to initiate the ideas in flood management include the various elements of the community, make an appeal to the community and socialize the effort of flood management so the people also involved in it and participate, although only force that can be given as forms of the participation. The community involvement in disaster management is very important, because the community who utilize the environment and also felt the impact of the flood so with the participation of the community, it can form the people behaviour who know, aware and concern in protecting the environment so flood can be prevented.

Gontor Modern Islamic Boarding School also has an important role in the flood management in Ngampel village. People have complained about the slow of normalization process in Pelem River by The Local Government of Ponorogo. Therefore, the community made a cooperation with Gontor Modern Islamic Boarding School, which is also located close to Ngampel village, to submit the petition proposal for improvement or normalization process of Pelem River to the Central Government. The petition proposal from Gontor Modern Islamic Boarding School was immediately responded by the Central Government to realized. Through The Central River Region of Bengawan Solo, the efforts of River Pelem normalize was done. Although only 5 miles along, but this river normalization can reduce the risk of flood in Ngampel village.

### B. Emergency Response of Flood

At the time of flood occurred, emergency response efforts must be implemented so it will not to cause the high victim. Early warning system is needed in a situation like this. But in Ngampel village, there is no flood early warning system. When flood occurs, the role of telecommunications equipment to be important for the people in this village. Telecommunications equipment used is “kentongan” or a cell phone. This communication is necessary to bring the news to the region that still has not been affected by the floods, so they can prepare themselves if the water flooding to that area. This communication is also necessary to bring the news to the related stakeholders to immediately get further treatment. The related stakeholders include The Regional Disaster Management Agency, The Police and The Health Department. The Regional Disaster Management Agency in emergency response, has a role as an Executive Command, who was assisted by The Police, the volunteers and The Health Department. The emergency response equipments were prepared by The Regional Disaster Management Agency include: 2 units of rubber boat completed with paddles, boat engines, and buoys. 1 unit rubber boat completed with 10 units buoy with the capacity for 10 people. The other emergency response equipment include: tent squads, generators and water treatment that serves as a provider of clean water to disaster victims. The Regional Disaster Management Agency also has a car that can be used to transport the emergency response equipments.

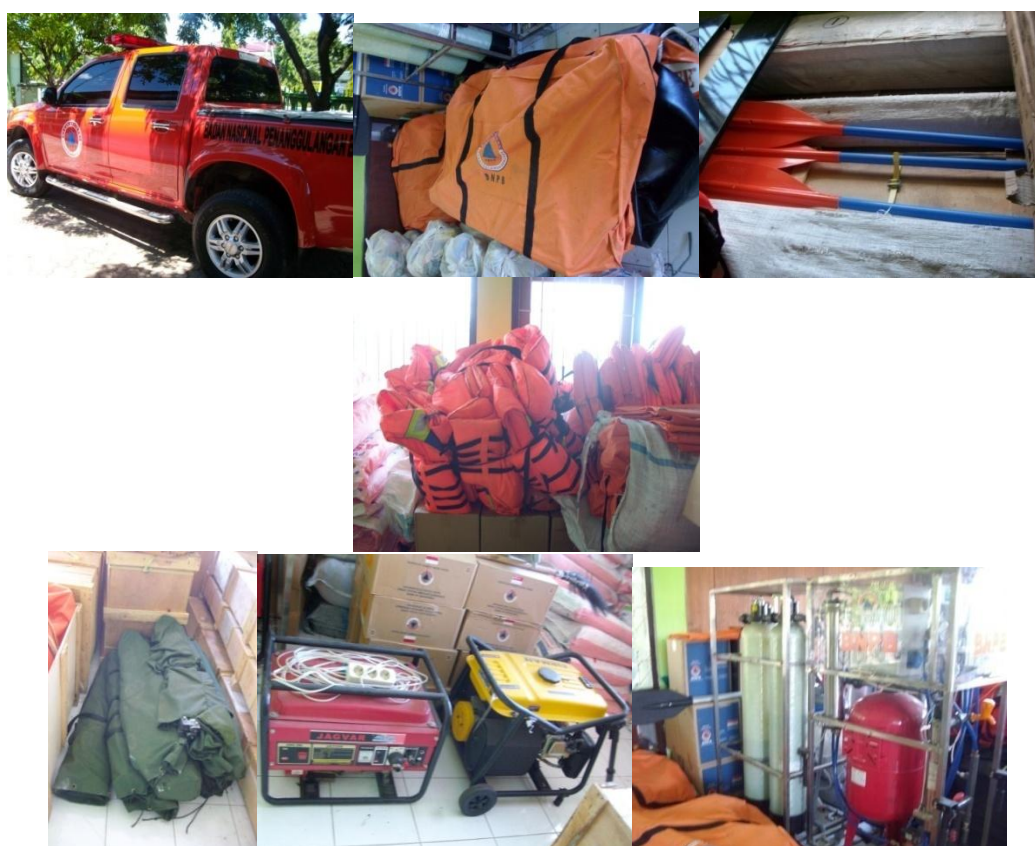


Figure 2. The Emergency Response Equipments of Flood in The Regional Disaster Management Agency of Ponorogo  
(Source: Reseacher Documentation, 2013)

The initial steps by The Regional Disaster Management Agency in preparing for an emergency response was to create the volunteer teams which cooperate with the existing universities in Ponorogo, such as Muhammadiyah University and National Islamic Academic. These volunteers were given advance supplies about the basic material of rescue and swim, also the technical guidance to rescue the disaster victims.



Figure 3. Potential Rescue Team Training for Disaster Volunteers  
by Regional Disaster Management Agency of Ponorogo  
(Source: Regional Disaster Management Agency of Ponorogo, 2012)

Volunteers, who have formed, during the emergency response will be contacted directly and asked to handling the disaster victims. During at the disaster site, the volunteers moved based on the command of The Regional Disaster Management Agency. Beside the volunteers, the emergency response was also carried out by the Police. The role of the police in emergency response include:

1. Help to evacuate the people from flooded area to a safer location using a cart.
2. Help to secure the livestock owned by the community.
3. Appealed to the community to secure personal items so they were not destroyed by the flood.
4. Help to distribute the aid to the affected community.



Figure 4. Evacuation Process Doing by Police on Flood Disaster in Ponorogo 2012  
(Source: The Police of Ponorogo, 2012)

Besides the Police, Health Department also took to the disaster area when the flood occurred. The roles of The Health Department include: the provision of health services to flood victims, providing logistical support to flood victims, to collect the data on the number of victims and the type of disease which infected the flood victims, also to perform the water treatment by giving chlorine to the contaminated wells caused of flood. Water that has been boiled with chlorine then could be consumed. Besides using chlorine, The Health Department also provides "Air Rahmat" or a powder that could be put into that polluted water so that the water could be consumed without cooking it first. However, the usage of "Air Rahmat" is rarely performed because the complexity of the procedures through to obtained "Air Rahmat", so giving chlorine is a step that could be done by the Health Department to provide the clean water supply for the flood victims. The diseases that often occur during the flood was not a serious illness.

Although the itching disease often complained by the people who were the flood victims, but the people did not get treatment to the health posts which have been provided by The Health Department. The emergency response equipments provided by the Health Department include: inflatable boats, emergency kits, and personal kit which consist of a raincoat, head lamp, boat shoes, and folding knives, which each of it contained 4 units. Officers were deployed to the disaster site, namely Rapid Response Team which consist of The Head of Clinic as a responsible and Doctors as a coordinator which comprise the midwives, nurses, nutritionists and sanitation section. Based on the data in Rapid Health Assessment from the Health Department that the flood which occurred in Ngampel village on February 22, 2012 at 09.00 am reached a height of 0.5 meters for 48 hours. The identification about the impact of this disaster showed that the number of houses which flooded as 200 pieces, the number of wells about 50 pieces and were also contaminated about 50 pieces. The number of victims aged 0-5 years was about 100 people, aged > 5 years was about 40 people, and the pregnant women was about 10 people. The number of infants with malnutrition conditions recorded by 1 person. During the last flood, the victims evacuated in a mosque as a temporary shelter, start from 19.00 am until 06.00 pm. The environmental sanitation conditions in the camps showed that the latrines and the landfills was inadequate. But the water supply was sufficient for the flood victims. Prevention efforts that have been made by The Health Department were the establishment of a disaster response team and set up a health posts at the disaster site as 1 piece with health professionals involved as 4 people. Common type of the disease include: diarrhea, physical and emotional trauma, also skin diseases or itching. The constraints faced by the medical team during the flood emergency response is still inadequate preparedness of the necessary logistics, such as chlorine supplies, PAC, and aquatab, whereas for the readiness of drugs is sufficient for all of the flood victims. Follow-up efforts after flood carried out by the Health Department was monitoring the affected areas and early awareness of post-disaster disease.

The community in Ngampel Village has a disaster preparedness to encounter if the flood is back. The behavior of mutual cooperation among the people are still strong enough so it is as its own power in order to minimize the risk of disasters. Early warning system when flood was coming carried by the villagers using “kentongan”. “Kentongan” is a traditional tool to warning the people in that village when the emergency response of everything occurred in this village (Figure 5). “Kentongan” will be emitted when flood reached the highway, so the people can prepare to rescue themselves. The equipment used during the emergency response to evacuate the villagers who was trapped in flooded houses was use a simple equipment. It was rubber tires that serves as a float. Evacuation was done by the people themselves before the help comes from another institution. Evacuation of flood victims took a secure location. It was in Ponorogo-Pacitan highway, schools and mosques which were not flooded. At the time of the evacuation, people do not bring their items. The goods are left behind in the house, and after the flood recede, they would back to their house to saw their goods. This was done because the level of environmental safety at the time of flood in this village was still fairly well preserved.



Figure 5. “Kentongan”  
The Traditional Tools of Emergency Response in Ponorogo  
(Source: Ngampel Village Office, 2012)

Type of assistances which provided to flood victims consists of staple food, rice packets, clean clothing, and medicines. This assistances obtained from The Regional Disaster Management Agency, The Health Department, The Local Government, also from other parties that provide assistance voluntarily. The universities also have a pretty good role in providing assistances to flood victims.



The provision of assistance by universities incidentally or only when a disaster occurs. The universities in Ponorogo involved Muhammadiyah University and National Islamic Academic. The one of efforts made by these universities is the formation of Spontaneous Team consisting of lecturers/staffs and students. The lecturers and staffs who was involved in this Spontaneous Team appointed by the Head of University, while the students are students from the Student Affairs Unit consisting of Nature Lovers Student. The Spontaneous Team before was getting disaster training from The Regional Disaster Management Agency. One of the training was the SAR Training involves students from Muhammadiyah University of Ponorogo and National Islamic Academic of Ponorogo. Assistance provided by Spontaneous Team was the opening of post-disaster center for victims. The role of the posts was established were to distribute the aids which collected from voluntary. The voluntary assistances formed as cloths and funds. Especially in National Islamic Academic of Ponorogo, the assistance was provided were the emergency response's tools such as rubber boats and others. National Islamic Academic of Ponorogo is a university in Ponorogo that has a comprehensive emergency response's tools. Assistances given by all of the parties was an effort to ease the burden of the flood victims.

### **C. Rehabilitation Effort in Post Disaster**

Flood has a big impact for the disaster victims. These impacts include physically damage or psychological trauma for the disaster victims. The efforts to undertaken after the devastating floods was the recovery of the damage, both physically and psychologically. The recovery efforts also involves related parties, which also consists of: Division Rehabilitation and Reconstruction of Regional Disaster Management Agency, Commission C and D of Regional Parliament in Ponorogo and The Department of Health.

The work plan of rehabilitation and reconstruction in 2013 was done by Regional Disaster Management Agency includes several efforts, including:

- Recovery of physical health through improved the quality of refugee medical services.
- Recovery of psychological health in a way to motivates the affected communities.
- Disaster recovery:
  - 1) Emergency Response for 3 x 24 hours
  - 2) Re-enable the economic of the community
- Set up the refugees in the affected communities:
  - 1) Develop the scenarios of disaster management
  - 2) Recovery of a food source for the population in the disaster areas
- Rehabilitation and Reconstruction of the disaster areas:
  - 1) Recovery the infrastructures

The rehabilitation and reconstruction efforts were undertaken by Regional Disaster Management Agency also involves the several parties, include: Commission C and D of The Regional Parliament of Ponorogo, Public Works Department, and Health Department. The cooperation among Regional Disaster Management Agency, Commission C of Regional Parliament and Public Works Department was the physical recovery efforts in the improvement of infrastructure was damaged by the flood, while the co-operation with the Commission D of Regional Parliament include the social efforts and provide the assistances to the flood victims. The infrastructure improvements refers to the kind of the damage. After identifying the existing damage, improvement efforts involved the related parties for the Local Government Offices and the community. Health Department plays a role in the recovery of psychological conditions (trauma) and physical of the flood victims. Rehabilitation and reconstruction efforts also involve the local community. The community's role in the rehabilitation efforts include:

- a. Establishment The Disaster Resilient Village, where the community will be educated about the capabilities in disaster response, start from early detection, when the disaster occur, and the efforts to help the victims. But, the formation of The Resilient Village is still not done for Ngampel Village.
- b. Formulate the necessary assistances for the flood victims. When the people get help as their required, the recovery from the trauma can be done well.  
In addition to the things mentioned above, another attempt of post-disaster should be made by Regional Disaster Management Agency, as coordinator of disaster management effort, are:
  - a. Identifying the cause of the flood so the further treatment efforts for prevention of flood could be done.
  - b. The proposes to permanently repair damage to the authorities in management of Bengawan Solo river basin. This proposed also need to consider the sustainability of the improvements in order to minimize the flood and its impact. The mechanism to request the flood material through in 2 ways:

1. The Central authority  
The Letter addressed to the Central River Region of Bengawan Solo with a copy to the Provincial of Irrigation Public Works Department, The Water Resources Management of Madiun River Basin Unit and Perum Jasa Tirta.
2. Provincial authority  
The Letter addressed to the Regional Water Resource Management of Madiun River Unit with a copy to the Irrigation Public Works Department of East Java.
- c. Making the flood report to the authorities. This report includes: reports of flood chronological, the cause of the flood, the impact of the flood, the inventory report of the damage caused by the flood, and the map of the flood prone areas which are equipped with a risk map.
- d. Formulate an early warning system of flood. There is no flood early warning system yet in Ngampel village so the people can not prepare themselves if the river overflowed and flooded the area where they live. The formulation of early warning systems is important to do as flood mitigation efforts and also to reduce the impact of the floods. This formula results should be socialized to the community, especially the people who live in flood-prone areas, so the people will be know, understand and be able to prepare themselves if there is the possibility of flood occur again in their region.

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