Resilience of persons with paraplegia for earthquake disaster victims in Bantul Regency

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Abstract. The purpose of this study was to analyze the factors and stages of resilience of people with paraplegia victims of the earthquake disaster in Bantul District in 2006. The research method used was a mix method with a population of 124 people with paraplegia and a sample of 44 people with paraplegia. Resilience in people with paraplegia is achieved through 4 phases: stress phase, self-acceptance and adaptation phase, self-development / capacity building phase and resilient phase (independent in mobility, productive and socializing). The determinants of resilience of paraplegia with different research are factors accessibility and adaptation factors.

1. Introduction
Indonesia is considered as one of the disaster-prone countries because it is located at the crossroads of three very important faults of the earth namely the Pacific fault, the Indo-Australian fault, and the Eurasian fault [1]. Disasters that occur are divided into two namely hydrometeorological disasters and geological disasters [2]. Hydro-meteorological disasters that often occur in Indonesia are floods, forest / land fires, extreme weather and drought. While geological disasters that occur are earthquakes, tsunamis, volcanic eruptions, and landslides.

Based on data collected by the National Disaster Management Agency (BNPB) in 2016, that in 2005 to 2015 there were 1,800 disasters comprising 78% (11,648) hydro meteorological disasters and 22% (3,810) geological disasters [3]. The data shows a fairly large amount and continues to increase from year to year. If observed the comparison of the number of meteorological hydro and geological disasters is not comparable, but the geological disaster events have a great impact both in terms of the number of victims and economic losses. An example that often occurs in Indonesia is an earthquake.

An earthquake is a geological disaster that can cause other disasters, namely tsunamis and fires [4]. Severe damage and casualties due to the earthquake that occurred quite a lot. Based on data compiled by the authors from various sources in Indonesia from 1983 to 2018, there were 37 major earthquakes above 5 SR. The largest earthquake occurred in Aceh (2004) resulting in 131,028 fatalities and 37,000 were declared missing [3]. In the second sequence, the earthquake in Papua (1976) killed 9,000 people, and the third place in Yogyakarta (2006) killed 6,234 people.
In 2006, the Special Region of Yogyakarta was rocked by a tectonic earthquake with a magnitude of 5.9 SR in the morning with a death toll of 6,234 people (Data from Bantul Regency Social Service, 2006). The number of victims who were seriously injured and in need of rehabilitation was 1,754, consisting of victims who suffered spinal injuries and patients who needed rehabilitation[5].

Most victims came from Bantul Regency, caused by damage to buildings and infrastructure that occurred very badly. Based on the results of research on earthquake damage in Bantul Regency consisted of 34.88% severely damaged, 4.75% moderately damaged, and 60.37% slightly damaged (Nurwihastuti, 2013). Severe and moderate damage occurred in the plain areas of Bantul Regency while minor damage occurred in the hilly and mountainous areas of Bantul Regency. This condition is caused by several factors, namely (1) there are dense settlements in the plain area; (2) Plains area close to the epicenter (earthquake fault)[2].

Earthquake victims who suffered severe injuries, namely spinal cord injury, leg amputation, amputation of the hand, fracture femur and broken back which currently live to be disabled. Bantul Regency Social Service data (2017) shows the number of disabled persons due to the earthquake was 891 people, with varying conditions. While the total number of disabled people in Bantul Regency is 1,940 people consisting of adults and children spread across seventeen districts in Bantul Regency which can be seen in Table 1.

The data in Table 1 shows a fairly large number and requires special attention from the Government. The majority of the living conditions of people with disabilities are still apprehensive and are in families who have not yet met their needs. Poverty and disability are indeed two problems that are difficult to separate[7]. Disabled people face many obstacles, restrictions in many forms making it difficult to access infrastructure, obtain adequate education, good health services and decent work[8].

| No | District       | Disabilities Are Not Due to Earthquakes | Disability Due to Earthquake |
|----|----------------|----------------------------------------|-----------------------------|
| 1  | Bambanglipuro  | 155                                    | 103                         |
| 2  | Banguntapan    | 133                                    | 37                          |
| 3  | Bantul         | 121                                    | 27                          |
| 4  | Dlingo         | 113                                    | 6                           |
| 5  | Imogiri        | 141                                    | 59                          |
| 6  | Jetis          | 149                                    | 107                         |
| 7  | Kretek         | 109                                    | 13                          |
| 8  | Pajangan       | 55                                     | 24                          |
| 9  | Pandak         | 106                                    | 47                          |
| 10 | Piyungan       | 103                                    | 102                         |
| 11 | Pleret         | 134                                    | 111                         |
| 12 | Pundong        | 136                                    | 132                         |
| 13 | Sanden         | 69                                     | 2                           |
| 14 | Sedayu         | 57                                     | 0                           |
| 15 | Sewon          | 116                                    | 113                         |
| 16 | Srandakan      | 117                                    | 2                           |
| 17 | Kasihan        | 126                                    | 18                          |

Amount: 1,940  891

Source: Bantul Regency Social Service in 2017

Difabel who experience disability since birth does not experience many obstacles in living their daily lives. Unlike the diffable due to the earthquake disaster in Bantul District, which experienced disabilities when they were adults or teenagers, this requires a lot of adaptation to the various current
conditions. Forms of adaptation for new disabled people are (1) psychological self-acceptance; (2) adaptation of the use of assistive devices in daily life; (3) adaptation socially; (3) adaptation in economics [9].

People with disabilities due to the earthquake experienced trauma, difficulties in carrying out daily activities, being fired from work, difficulty finding jobs, accessibility of education also experienced obstacles. More severe conditions occur in those who are disabled due to spinal cord injury (paraplegia), they have to do all activities depending on the wheelchair, experiencing extraordinary pain and also a threatening disease in the skull every day. Based on these realities, researchers are interested in examining what factors influence resilience of people with paraplegia after the 2006 earthquake.

2. Resilience Theory
Mc Entire et al., (2002) explain that natural disaster analysis has traditionally focused on the concepts of vulnerability, risk, and emergency management [10]. Gunerson, (2010) states that resilience theory views natural disasters as disruptions in the socio-ecological system [10]. Resilience theory can add value to disaster management through its emphasis on complex system dynamics (i.e. uncertainty, non-linearity); ideas of flexibility, novelty and innovation; and multi-scale perspectives (spatial and temporal). Thus the resilience approach can support more proactive involvement in managing change such as human responses to, and recovery from, natural disasters.

Community resilience is described as the ability of the community to absorb, manage, and revive after a disaster which is characterized by the community's ability to strengthen coping through adaptive capacity after a disaster [11]. Community disaster resilience is a process that arises from a network of adaptive capacity including the capacity to develop and maintain social capital as expressed through a sense of belonging, a sense of belonging, a sense of place, and participation in civil society [12].

According to National Research Council [13] based on the context of hazard and disaster the definition of resilience that is often cited is as follows: (1) The ability of an asset, system, or network to maintain its function or recover from a terrorist attack or other incident; (2) The capacity of a system, community or community that is potentially exposed to the danger of adapting, by refusing or changing to achieve and maintain an acceptable level of function and structure. This is determined by the extent to which the social system is able to regulate itself to increase this capacity to learn from past disasters for better future protection and to increase risk reduction measures; The ability of social units (organizations, communities) to mitigate risks and contain the effects of disasters, and carry out recovery activities in a way that minimizes social disruption while also minimizing the effects of future disasters. Disaster Resilience can be characterized by a reduction in the possibility of damage and failure of critical infrastructure, systems and components; reduce injuries, casualties, damage and negative economic and social impacts; and reducing the time needed to restore a particular system or set of systems to a normal or pre-disaster level of functionality.

Personal resilience describes one's capacity to adapt psychologically, emotionally and physically quite well and without harming oneself, relationships or personal development in the face of difficulties, threats or challenges [14]. In the political ecology literature and changes in the global environment it is explained that the concept of adaptive capacity, namely the ability of a system to adapt to change, moderate effects and overcome disruption [15]. The Department of International Development-DFID defines disaster resilience as the ability of communities and households to manage change, through maintaining or changing living standards in the face of shocks or pressures [16].

3. Methods
The research location was chosen six sub-districts out of seventeen sub-districts in Bantul Regency. The reason for choosing the location of this study is based on the highest number of earthquake victims who suffered spinal injuries and is currently a person with paraplegia. The sample subdistricts
are Pundong Subdistrict, Piyungan Subdistrict, Sewon Subdistrict, Jetis Subdistrict, Pleret Subdistrict, and Bambanglipuro Subdistrict.

The population of people with paraplegia in the six selected districts is 124 people, all of whom use wheelchairs for daily mobility, motorcycle modification and bicycle modification. Respondents in this study were divided into two respondents, those with paraplegia who were surveyed with a questionnaire and families with paraplegia who were interviewed separately with people with paraplegia. Survey of people with paraplegia to gather information about the factors that cause paraplegia, the factors of resilience / resilience of paraplegia in living as a difable and to find out the condition of livelihood assets. In-depth interviews (indept interviews) together with families with paraplegia to conduct data validity and explore information from the perspective of the family how the family life process of informants and people with paraplegia after becoming disabled. According to Gay and Diehl (1992), the more the number of samples the more representative the results of the study and the number of samples determined based on the type of research that is at least 10% of the population (descriptive research), correlational studies of at least 30 subjects, causal comparison studies of at least 30 subjects per group and experimental research of at least 15 subjects per group [17]. In this study the number of samples was 44 people with paraplegia, 30% of the total population of people with paraplegia in the six sample districts. This number follows the theories from Gay and Diehl where descriptive research is a minimum of 10% of the total population. The selection of respondents was random sampling by means of stratified random sampling. Explanation of the number of samples in each district is shown in Table 2.

Quantitative data analysis is done by coding data (scoring) then processing descriptively frequency, crosstab, conducting validity tests, reliability testing with SPSS software version 24. Qualitative data analysis is done by making interview transcripts then coding in accordance with the required data. After coding, the next step is to reduce the interview data. Data was chosen according to need, ie parts that reinforce the research findings by survey methods. After the data is selected, data interpretation is performed.

Table 2. Number of Populations and Research Samples

| No | Sample Location   | Number of Population | Number of Samples |
|----|-------------------|----------------------|-------------------|
| 1  | Pundong District  | 13                   | 5                 |
| 2  | Piyungan District | 18                   | 6                 |
| 3  | Sewon District    | 16                   | 5                 |
| 4  | Jetis District    | 15                   | 6                 |
| 5  | Pleret District   | 23                   | 8                 |
| 6  | Bambanglipuro District | 39               | 14               |

Source: 2013 Bantul Regency Social Service Data and Researcher Calculation

4. Result and Discussion

4.1. Resilience Factors

Based on the research results resilience factors of paraplegia people are divided into two factors, namely internal factors (originating from persons with paraplegia) and external factors (originating from outside persons with paraplegia, namely family, friends, community, NGOs and the Government).

Resilience of people with paraplegia is measured by three variables, namely (1) personal skills, (2) personal beliefs and attitudes, and (3) interaction, relationship and achievement skills. Each variable consists of several indicators as follows. Personal skills consist of several indicators namely receiving social support, problem solving, communication skills, coping with stress, and adapting to change. Personal beliefs and attitudes consist of several indicators, namely optimism, hope, self-esteem, religion and ownership. Interaction, relationship and achievement skills consist of several indicators, namely good relationships with others, contributions to society, access and protection processes. The
The results of the survey regarding the condition of resilience / resilience of paraplegia victims of the earthquake will be described in several items based on the order of the variables and indicators mentioned above.

The majority of people with paraplegia have good personal skills. This shows they are able to adapt, receive social support (from families, from the government, and from NGOs), and are able to solve the problems they face. In addition to the three indicators, there is one indicator used to measure the personal skills of people with paraplegia, namely communication skills. All respondents have good communication, this can be seen from their ability to share stories about sadness towards family, friends, psychologists provided by the government and NGOs. Having good communication skills makes people with paraplegia able to survive and overcome the problems they face. Relieve depression and sadness by communicating with family, friends and psychologists.

Personal beliefs and attitudes of people with paraplegia are measured from indicators of optimism with paraplegia, awards obtained by people with paraplegia, religion / beliefs, hopes and feelings of ownership. Based on the survey the majority of people with paraplegia have an optimistic attitude in living their next life after being a person with paraplegia. Interaction, relationship and achievement skills in this study were measured by the following indicators: good relationships with others, contributions to society, access to the use of protection processes and ways of adaptation. Based on the results of a survey with people with paraplegia it was found that the percentage of all people with paraplegia had a good relationship with other people. Most people with paraplegia feel they have a contribution to society, while others feel they have no contribution to society. Access and use of the protection process 89% of people with paraplegia can access and 11% feel unable to access.

![Figure 1. Personal skills](source: researcher data processing, 2017)

![Figure 2. Optimistic Attitudes](source: researcher data processing, 2017)

![Figure 3. Socialization Capabilities](source: researcher data processing, 2017)

![Figure 4. Time](source: researcher data processing, 2017)
4.2. Stages of Resilience
The process of resilience of people with paraplegia consists of several stages (1) Phase stress and depression, (2) Phase of self-acceptance and adaptation, (3) Phase of self-development and capacity building and (4) Phase of Resilience. In reaching each phase of paraplegia, it is supported by internal and external factors. Internal factors are factors that originate from persons with paraplegia, while external factors are supporting factors that come from family, friends, government and NGOs.

The process from phase one to the second phase based on the results of the study takes 6 months to 2 years. This depends on the personal conditions of each person with paraplegia. Internal factors that support this achievement are the communication skills of people with paraplegia, for example, expressing their sadness, disappointment and problems to other people. External factors are support from family, friends, Government and NGOs in the form of psychological assistance, mobility training as persons with paraplegia, and the establishment of disabled organizations to strengthen the disabled community.

The process from phase two to phase three takes 1-2 years. The success of each individual is different, depending on the strong will to be independent from people with paraplegia and the optimistic attitude of people with paraplegia. External factors in the form of family support (freedom of activity), support from the Government (training to improve skills, providing capital in the form of money and work equipment) and from NGOs (training to improve skills).

The dominant factor affecting resilience of paraplegia communities is economic development and social capital of paraplegia communities. Economic development is carried out in several stages, namely the provision of equitable home recovery assistance to all victims of the earthquake disaster, providing training in independence of mobility to people with paraplegia, providing training in increasing skills and providing capital assistance and equipment to people with paraplegia. The social capital of the paraplegia community consists of receiving social support, relationships and cooperation within the organization, leadership from the diffable and participation of the paraplegia person in the community.

The dominant factor affecting resilience of individuals with paraplegia is social support and communication skills. With social support from family, friends and the government and NGOs, people with paraplegia are able to rise from adversity (stress, depression due to being disabled), have an optimistic attitude, are able to solve problems and are able to adapt to the new environment and conditions.
5. Conclusions
Resilience of people with paraplegia can be achieved in four phases namely the stress / depression phase, the phase of self-acceptance and adaptation, the phase of self-development and capacity building, and the phase of resilience where people with paraplegia are said to be resilient if they are able to be independent in mobility, productive and socializing. Based on the resilience measurement tool that is CD-RISCH, the results of the study show that people with paraplegia have a high level of resilience (55%), and moderate resilience (45%). The determinants of resilience of people with paraplegia that are different from previous studies and complement the results of previous studies are accessibility and adaptation. Whereas personal competency and supportive factors also contribute to the resilience of people with paraplegia.

Figure 5. Paraplegia Resilience Process
Source: Researcher Data 2019
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