

Strengthening Local Capacity in Disaster Risk Reduction

(Case Study: Disaster Resilient Village in Batu City, East Java, Indonesia)

Nila Restu Wardani

Study Program of Geography Education
Kanjuruhan University of Malang
Malang, Indonesia

Corresponding email: nilarestu@unikama.ac.id

Dwi Fauzia Putra

Study Program of Geography Education
Kanjuruhan University of Malang
Malang, Indonesia

Abstract—Batu is a city located in the mountainous area and the elevation of 700-3000 m above sea level. Batu is surrounded by two volcanoes: Mount Kelud and Mount Welirang. These natural conditions give potential vulnerability to the society as it has high potential for disasters that can take place at any time. To manage the significant risk, Regional Disaster Management Agency or BPBD made policies and laws to the community through the "Desa Tangguh Bencana: Disaster Resilient Village (*Destana*)". The aim of this paper is to explain how local capacity in disaster risk reduction. The research method used descriptive qualitative approach. Data are collected by conducting field surveys, interviews, and information from relevant agencies. The results show that disaster index score of Batu is 134, which is categorized in the medium level. The evidence is natural disasters have occurred. There were a flash flood, Mt. Kelud erupted, landslide and forest fires. Batu has three disaster resilient villages: Gunungsari Village, Pandanrejo Village, and Sisir Village. Gunungsari Village and Pandanrejo Village belonging *Pratama* level, Sisir Village belonging *Madya* level. Human resources become a significant factor influencing the effectiveness of *Destana's* policy implementation. One of the *Destana's* principles is that society becomes the primary factor in the efforts to create disaster resilient community. Therefore, it is the society that actively participates in the implementation of this *Destana's* policy ranging from policy-making, conduct capacity building efforts to prepare for disaster and manage resources in order to reduce vulnerability and disaster risk. The other factors to support the effectiveness of *Destana's* policy implementation is cooperation and synergy among stakeholders. The Government of Batu, BNPB, and BPBD Batu City played a quite important role is providing technical and financial assistance in the three villages.

Keywords—*Disaster, resilient village, reduction*

I. INTRODUCTION

Batu is one of the city in East Java that has disaster risk index with 134 scores and located on 360 positions from 496 cities and regency in Indonesia. Based on this index, sensitive disaster in Batu City is in fair category. The risk level of

disaster in Batu based on risk disaster studies, is taken from physiography and demography in Batu.

Risk disaster level in Batu depends on contribution and interaction between three factors including: treat, susceptible, and Batu's area capacity in facing disaster. Disaster will make an effect if the threat level is too high as well as the susceptible is too big, while area and society are not having enough capacity to solve it.

Threat disaster in Batu based on physiography condition is: the elevation of 700-3000 m above sea level, surrounded by two volcanoes: Mount Kelud and Mount Welirang. Batu is also upper course *DAS Brantas* that art of its area is forest. Based on condition and data history disaster happened, show that 9 disasters that potentially happen in Batu are categorized become geology and hydrometeorology disaster (Planning Disaster Tackling Document Batu City, 2014-2019). Those are including: earthquake, mount eruption, landslide flash flood, dryness, whirlwind, epidemic and disease epidemic, forest and land of fires, and building and residence fires.

Risk disaster level in Batu is also studied based on the susceptible area with disaster. This is the susceptible mapping result by Province Government of East Java 2014.

TABLE. I SUSCEPTIBLE BATU CITY AREA

No	Disaster Types	Susceptible Level
1	Earthquake	Fair
2	Mount Eruption	Fair
3	Land Slide	Fair
4	Flash Flood	High
5	Dryness	Fair
6	Whirlwind	High
7	Epidemic and disease epidemic	High
8	Forest and Land of Fires	Fair
9	Building and Residence Fires	High

Source: Susceptible Mapping Result by Province Government of East Java, 2011

Based on the table showed above, Batu has susceptible high level on flash flood, whirlwind, epidemic and diseases epidemic, and forest fires. Batu's susceptible with flood is large because big felled trees that happen in upper course *DAS Brantas*. The biggest flood happened on 2004 that used up hundreds house, livestock, and two big bridges. Batu in fair level is susceptible on earthquake, mount eruption, landslide, dryness, and forest and land of fires.

The high-risk disaster also has been analyzed based on capacity area level and Batu's society in encountering disaster. Capacity studies are done by identifying individual skill, society, government institution, or functionary other in facing threat and doing prevention, mitigation, and preparing handling emergency which uses society's capabilities. Batu's government consists of 24 villages that have different capacity in an effort to risk disaster reduction. That difference is based on territory commitment, sources (infrastructure, human, financing), area's characteristic, and also disaster potential in that area.

Based on risk disaster studies, it has done risk disaster reduction with attention three aspects that consist of threat, susceptible, and capacity encountering disaster. One of the effort risk disaster reduction that is on strengthen the area of capacity and society in Batu. Strengthening capacity that has been done is the formation of Disaster Resilient Village (*Destana*).

Disaster Resilient Village is disaster management policies and laws to the community. To build safe houses and villages, communities need a range of incentives, resources and support. This side-event will show how real risk reduction and disaster resilient villages can be achieved through community action to build temporary shelters, microfinance to build safer houses and livelihoods, and climate adaptation for resilient habitats.

Disaster Resilient Village is framework society basic in the village with develop skill to know and manage threat, reduce susceptible, manage natural sources to reduce risk disaster in effort in continuing building without creating dependence to reduce risk disaster, so society will safe have endurance for disaster. According to *Perka BNPB* No. 1/2012 about General Guiding Village/Disaster Resilient Village, it's aimed that for village have autonomous skill to adaptation and face threat disaster potential, and self-recovered immediately.

The strategy that used in formed Disaster Resilient Village are: 1) Gender Principal Maintenance; 2) Improving Capacity; 3) Risk Disaster Studies Participation; 4) Integration Risk Disaster Studies in Building Plan; 5) Continuing Program and Institution. In this research will be described effort strengthen capacity and society participative in risk disaster reduction with formed Disaster Resilient Village.

II. METHOD

The research method used descriptive qualitative approach. Data were collected by in-depth interviews and information from relevant agencies: BPBD Batu City, *BAPEDA* Batu City,

Risk Disaster Village Reduction Forum/*Forum Pengurangan Risiko Bencana (FPRB)* village level. Research located at Pandanrejo Village-Batu City. Primary data and secondary data are analyzed with descriptive qualitative.

III. FINDING AND RESULTS

High or low level, the risk disaster faced by society depends on capacity of the society that has been solved. Batu's area is dividing into 24 villages and each has different efforts in risk disaster reduction. The difference of capacity is based on territory commitment, natural sources (infrastructure, human, financing), territory characteristic and potency. Capacity government mapping of Batu is done by two different objects including village perspective and Regional Work Unity or SKPD Batu (Tackling Document Disaster Plan Batu City, 2014-2019).

A. Batu City Government Capacity from Village Perspective

Capacity level of Batu's government encountering disaster is seen by the analysis result of a questionnaire which uses Hyogo Framework for Action (HFA) equipment. The 24th village in Batu has level in fair capacity that occurs in 3 subdistricts, which are: Bumiaji Subdistrict (9 villages), Junrejo Subdistrict (8 villages), and Batu Subdistrict (7 villages). This is drawing of capacity level in Batu city.

TABLE 2. CAPACITY PROFIL AGGREGATE INDEX RESULT SECURITY VILLAGE IN BATU

No	Priority	Priority Score Total	Priority Index
1	Definite that risk disaster reduction become local and national priority based on the powerful institution in done.	79,5	3
2	Identify, study, and control risk disaster and increase early warning.	77,5	4
3	Use knowledge, innovative, and education to build a certain culture safety and endurance in all level.	56,5	2
4	Reduce risk base factors	71,5	4
5	State of preparing and on the alert powerful of disaster effectively in all place.	56,5	4
PRIORITY SCORE TOTAL			68,3
TERRITORY ENDURANCE INDEX		3,4	

Source: Mapping Capacity Result by BPBD Batu, 2014.

The table above shows that aggregate capacity village in Batu's area still low, that is shown by endurance index area that is 3,4. That score gives an explanation that the territory has been done some actions to risk disaster reduction, but the reach is still sporadic because there is no institution commitment and or policy system. The result of the analysis shows that, from the view of area, lower index priority is the second priority. Commonly this is shown by the evidence that Batu's government is quite still not optimal implementing knowledge, innovation, and education to build safety culture and endurance in all village level.

B. Capacity from SKPD Batu City Perspective

Beside from village perspective, susceptibility of Batu's government is also seen from city perspective directly where the data and information are collected from questionnaire HFA conducted by Regional Work Unity or SKPD of Batu's government delegation

TABLE 3. CAPACITY PROFIL BATU CITY GOVERNMENT

No	Priority	Priority Score Total	Priority Index
1	Definite that risk disaster reduction become unnational priority based on power institution to do	82,5	4
2	Identify study and control risk disaster and improve early warning	87,5	5
3	Use knowledge, innovation, and education to build safety culture and in all level endurance	62,5	3
4	Based on risk factors reduction.	92,5	5
5	Consolidate alert on disaster for an effective response in all place.	87,5	5
PRIORITY SCORE TOTAL		82,5	
TERRITORY ENDURANCE INDEX			4

Source: Mapping Capacity Result by BPBD Batu City, 2014.

Based on table above, Batu's government has index score area 4 which means that Batu has commitment support and policy for all in risk disaster reduction. But in doing and practicing risk disaster reduction is still found restrictiveness in commitment, financial sources, and operational capacity in doing risk disaster reduction.

If it is compared between two endurance index area, from aggregate village and Batu's government perspective, it can be seen that the result is quietly so different. Based on this score comparison, the policy slice priority must be done by Batu's government into villages by the technique of intervening system. In risking disaster reduction plan, this policy slice becomes focus priority in tackling activity without any consideration if the disaster is occurring or not.

Policy priority that becomes vital are:

- Forming and making special area forum for risk disaster reduction.
- Powerful risk area studies document.
- Arranging curriculum school, education material, and training about risk disaster reduction.
- Arranging disaster contingency plan, training regularly to examine and improve programs disaster emergency.

Based on risk disaster reduction policy in Batu, has formed Risk Disaster Reduction Forum or *Forum Pengurangan Risiko Bencana (FPRB)* in two villages and one village as Disaster Resilient Village. The three Disaster Resilient Village are Gunungsari Village, Sisir Village, and Pandanrejo Village. Below is the more explanation about reinforcement society capacity in risk disaster reduction with Disaster Resilient Village.

Reinforcement Society Capacity with Disaster Resilient Village Program in Batu City.

In risk disaster reduction in Batu's village, Regional Disaster Management Agency or BPBD Batu brings about efforts in powerful society capacity in encountering disaster with these steps such as: reinforcement law basis to hold tackling disaster by arranging connected role and plan which are:

Risk Disaster Reduction Act Area Plan is an act plan from tackling disaster plan.

- Contingency Plan
- Operational Plan
- Rehabilitation and Reconstruction Plan

Reinforcement is focusing on institutional capacity in tackling disaster and support system. The main priority in reinforcement is forming and making area forum for risk disaster reduction that allows the entire important functionary. That forum is Risk Disaster Reduction Forum (FPRB) village level. FPRB is reinforcement institution capacity form which contains village society as building plan, prepared, risk disaster reduction and increase capacity in signification of post-disaster emergency. FPRB is also part of Disaster Resilient Village (*Destana*): FPRB in Batu City has organized in 3 Disaster Resilient Villages including Sisir Village, Gunungsari Village and Pandanrejo village. This is the explanation of disaster village in Batu.

C. Disaster Resilient Village in Batu

Disaster Resilient Village is a village which has autonomous skills for adapting and encountering disaster threat and also self - recovery the effects of disaster. So, a disaster resilient village is a village having skill to know threat in their area and able to organize data sources to reduce susceptible and also increase capacity for risk disaster reduction. This skill is created in reaction plan including preventive effort, alert, risk disaster reduction, and improving capacity to dignification post-disaster emergency.

In forming the resilient village, Batu's government arranges policy and strategy such as:

- Involving all society mainly for more susceptibility whether physically, economically, environmentally, socially, and also for special attention on gender priority program.
- Using and utilizing dependence natural sources in that area with minimum external facility.
- Building synergic program in all actors (minister, state institution, social organization and university) to capacity building in the village society.
- Supporting policy commitment in form, source, and technique to help central government, province,

regency/town and village government which is suitable with society requirement and expectation.

- Improving knowledge and society's awareness about threat and potential village susceptibility.
- Reducing susceptible village society to risk disaster reduction.
- Reinforcing society capacity to reduce and adapt risk disaster.
- Applying all risk management forms, risk identification, risk studies, preventive, mitigation, risk reduction, and risk transfer.
- Combining risk disaster reduction in sustainability.
- Giving priority to risk disaster reduction to program plan and institution social activity village, so risk disaster reduction penetrates to all activity in society level.

The increase of society capacity in resilient village is conducted inactivity phases including:

- Socialization to society by BPBD of Batu's government in Gunungsari Village, Sisir Village, and Pandanrejo Village.



Fig. 1. Socialization for the society

(Source: BPBD Batu City)

- The formation of Risk Disaster Reduction Forum (FPRB) in village level that member is from teenagers, village functionaries, man and woman citizen. FPRB is contiguous with BPBD.

- 1) *Disaster Introduction*
- 2) *Disaster Risk Identification*
- 3) *Treat High-Risk Analysis*
- 4) *Risk Management*
- 5) *Receive danger alert*
- 6) *Monitoring of treat disaster development*

Doing activities in Disaster Resilient Village are done by daily management that consolidates in Risk Disaster Reduction Forum (FPRB). Their activities such as:

- 1) *Administration Activity*
 - 2) *Daily Management meeting (once a month)*
 - 3) *Regularly coordination with village government about program development that is done.*
 - 4) *Socialization to the citizen.*
- Focus Group Discussion (FGD) in studying the risk disaster in each area of village.



Fig. 2. FGD by FPRB

(Source: BPBD Batu City)

- **Training.**



Fig. 3. Training with tend evacuation building and disaster victim evacuation

(Source: BPBD Batu City)

- Donation supply in village level and forming participation village government include:

- 1) *Center room*
- 2) *Completing Administration support*
- 3) *Car Preparation*
- 4) *HT*
- 5) *Fund Calculation*

The three resilient villages in Batu are:

1. *Resilient Disaster of Gunungsari Village*

Gunungsari Village located in Bumiaji Subdistrict, Batu City. Gunungsari Village is the first resilient village that is formed in 2015. Resilient village Gunungsari still on the first level because in encountering disasters is still independence and contiguous by BPPD Batu. Historically and physiographical, the threat disaster occurred in Gunungsari Village is landslide, whirlwind, and flash flood. The powerfulness of Gunungsari Village can be drawn as: 1) capacity volunteer improving; 2) training for volunteer to solve

disaster; 3) training to give valid information about disaster that occurs and studying accurately about disaster in Gunungsari Village.

2. *Resilient Disaster of Sisir Village*

Sisir Village is one of villages in Batu City. Sisir Village is formed as Resilient Village Disaster because it is located in the middle of town and potentially slick flood in the rainy season. Sisir Village is formed as the second Resilient Village Disaster after Gunungsari Village. But on 2016, it became the first example of resilient disaster because got the appreciation as the first winner in East Java province. This could be reached because of the administrative completeness (secretarial document, decision letter, and organization structural that worked according it's function), village apparatus support, and real action (use area to reforesting and faith work).

3. *Resilient Disaster of Pandanrejo Village*

Pandanrejo Village located in Bumiaji Subdistrict and it is the third Disaster Resilient which is formed by BPBD Batu. The level of Disaster Resilient is still in the first level. BPBD facilitates Pandanrejo's society especially on FPRB Pandanrejo Village to arrange community action that hopefully is able to construct their self in action planning on risk disaster reduction in Pandanrejo.

Based on FPRB condition of those three resilient disasters in Batu, the problem is the member activity of FPRB in village level is not flat. Member of FPRB still waits BPBD instruction to arrange action plan community that is related to risk disaster reduction. Besides, the other problem is limited fund because donation income just subsided from ADD (Calculation of village fund) as Rp 1.000.000,00 / year.

IV. CONCLUSIONS

Resilient Village Disaster is a path to increase state of being preparation and on the alert capacity society encountering disaster. Powerfulness of society capacity in risk disaster reduction by playing role of society as subject as well as an object of tackling disaster. Thus society is given chance widely in doing efforts to plan, do, and control dependently in tackling disaster.

The two disaster resilient villages in Batu on the first level are Gunungsari Village and Pandanrejo Village, while Sisir Village directly included into Madya level because autonomously the increase in arranging and doing community's action plan in risking disaster reduction.

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