Yogyakarta City
Disaster Risk Resilience: Living in Harmony

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1. The Decade of Natural Disaster

In this last decade there have been several natural disasters that have impacted to city of Yogyakarta. The epicentrum (centre) of natural disasters are not directly within administrative area of Yogyakarta City, but the impact had resulted damage into the city, and also to community daily activities.

It could be argued that some natural disasters are natural phenomenon, causing Yogyakarta City get the indirectly physical impact, and the other effect is disrupted economic activities that give rise to large losses. The impact of disaster has encouraged and influenced the policies from the central government to declarea national disaster and rescue-recovery policy.

Several national scale natural disasters that struck Yogyakarta in this last decade:
1. 5.8 SR Earthquake : May 26, 2006
2. EruptionMount Merapi : October 26, 2010

In addition to natural disasters, some annual cycle of disasters that impact is floods, typhoon, fires, and so on. Although it did not become a major event, it gave judgment on the existence that disturb condition of the city and have an impact on the city.

2. Yogyakarta City at Glance

Yogyakarta City has 32.5 km2 areas with 394.012 populations (2013). Population density is 12,123 people per km2. As urban agglomeration, a city should be able to serve the urban community activities 2-3 times the number of population. In line with vision of Yogyakarta, assign as a city of trade and services center regional scale, the activities conducting in the city provide economic movement of local, regional, national almost in all sectors.
Yogyakarta City is geographically located in the middle of the plains region flanked by neighboring districts with high character of Mount Merapi slope in the north (Sleman) and coastal areas in the south (Bantul). Potential of the region realize the geographical character and very varied environment because it is flanked by abundant natural resources.

There are three rivers flowing through urban areas: Winongo, Code, and Gajah Wong. Culturally each one has different philosophical concept. In addition for providing a source of livelihood and life for the citizens, from those three rivers, sometimes natural disaster can make overflow that damage dykes and settlements, especially riverbank areas.

3. The Image of Yogyakarta City

Yogyakarta City was founded on October 7, 1755, along with construction of the Palace Ngayogyakarta Kingdom by Sri Sultan Hamengkubuwono I, in the former Alas Bering, in an area between river of Winongo and Code, where it is strategic location of the defense and security aspects. Although the administration of Yogyakarta newly formed on June 7, 1947, concurrent to be formed of regional organization specifically Mayor and City Council of Yogyakarta.

Yogyakarta City located in the middle of urban areas into the capital of the province of Yogyakarta Special Region. Historically, It has many inherent image as a city of culture, struggle, bicycles, tourism, education, and many more. The city is not too big but it holds a lot of imagery and predicate demanding to always everlasting.

Yogyakarta became a national barometer especially in socio-geopolitical aspects. Therefore in various sectors events would be triggered discourse widespread and fast. Issues and events in local level could be the subject of discussion at the central officially or other social media. It is a representation of Indonesia, an archipelago country with diverse cultures, tribes, languages, races, characters, and so on and it is called Bhinneka Tunggal Ika in miniature scale.

Yogyakarta City always chosen to be 'The Most Livable City' in Indonesia with the relatively highest score compared to other major cities based on the survey indicators with criteria including aspect of spatial, environmental, utility infrastructure, educational facilities, health, economic, security and social. Survey has been done by assessing citizens perception viewed their city themselves. This assessment is conducted by Indonesian Planner Association since 2009, and until now that has always put Yogyakarta with the highest score.
4. The Natural Disaster that Impacted Yogyakarta City

i. Earthquake

The earthquake shook Yogyakarta Special Region and Central Java on Saturday, May 27, 2006, at 05.55 am for 57 seconds. The strength of the earthquake was 5.9 Richter scale. But according United States Geological Survey, the strength of the earthquake was 6.2 Richter scale. The earthquake was not happen until one minute, but it has given the big impact. There was enormous victims, 6,234 persons died, 36,300 were injured, 154,000 houses were severely damaged, and 260,000 houses were damaged (Ministry of Social Welfare, 2006). The total damage of the earthquake have been estimated 3.1 billion US$ (CGI, 2006). 90% the greatest loss were experienced by civilians. Many home residents and production facilities of medium and small enterprises (UMKM) were damaged.

![Image of earthquake damage]

The impact of the earth quake are 90% of civilians houses were damaged

The heritage building were severely damaged

ii. Mount Merapi Eruption

Merapi Mount is the most active volcano in the world. It was happen the large eruption on Tuesday October 26, 2010. The strength of eruption was threefold of the previous eruption. The pyroclastic flows of Merapi Mount burned the villages in the area that were located in 5 km radius from the top of Merapi Mount. The areas that got the direct impact of Merapi eruption are Province Yogyakarta Special Region and some areas in Central Java. Yogyakarta City got the indirect impacts of Merapi Volcano. Those indirect impacts were ash rain and lava floods that trough in Code River.

Based on data from the National Disaster Management Agency (Badan Nasional Penanggulangan Bencana), Mount Merapi eruption caused 302 people killed. As much 368 victims being hospitalized in which 190 of them got burnt. The eruption also forced more than 148,000 people fled to 328 places spread over 4 regencies/city in the province and destroyed 2,636 in six villages in Sleman regency.
In social sector, 13 schools were destroyed (6 elementary schools, 2 vocational schools, and 5 kindergartens) and 4 Community Health Centres (1 Puskesmas, 3 Supporting Puskesmas) were broken. The damage to the productive economic sectors caused very significant impact in public losses. Not less than 8 traditional markets were severely damaged; 1020.5 Ha of community forest, 2,500 Ha of snakefruit farm (salak), 604 Ha of non-snakefruit farm, 315 Ha padi (rice fields), and 14 Ha fishponds were buried by the volcanic materials. A number of 3,413 cows dead, as well as 241 business units (Small and Medium Industry). About 812 business actors directly affected, 194 of them lost their business. It is also estimated that the potential stuck debts were Rp 146 billion (influenced about 6.320 clients).

iii. Volcanic Ash Rain of Kelud

Mount Kelud is volcano that is not very active compared to Mount Merapi. Mount Kelud is located in the east Java. The distance Kelud from Yogyakarta city is 235 km. On Friday, February 14, 2014, Kelud erupted and gave impact volcanic ash rain. The thickness of volcanic ash was 1-3 cm. The volcanic ash rain made the city off. It because the visibility in the city only 5-10 m.

Ministry of Health wrote 2000 people were impacted respiratory impacted since volcanic ash wrapped the city. At the time, there was rain and the movement of volcano ash rain was hampered. But, after that, there was not rain in some days and made the city was difficult cleaned.

The ash were very thick and made the airport must be closed for one week. The pilot visibility only 200 m, it was very dangerous for the flight. Whereas, the
airport is not only serve the domestic flight, but also the international flight, such as the flight to Singapore and Kuala Lumpur. It made some national and international events that planed in Yogyakarta must be cancelled.

The other impact of volcano ash rain was the tourism sector in the Yogyakarta that is economic locomotive in Yogyakarta. For 3 days, the loss of tourism sector was 2 billion rupiah daily. The tourist arrivals in Yogyakarta were also decreased; it could be seen from hotel occupancy that fell down until 60%. Not only that, there were many meeting agenda that were cancelled in that weekend.

![The Volcanic ash of Mount Kelud cover up the airport and make the airport must be closed for a week.](image1)

![The volcanic ash of Mount Kelud cover up all of the city and make the economy activities such as tourism sector was disturbed](image2)

5. Managing Disaster Recovery

The disaster recovery is determined by strategic policy at a critical time. There are two important steps that are related with recovery time after the disaster is happen. They are the emergency response period and the post disaster period.

- **The emergency response period** is appointed by the time that depends on the level of disaster and the impact of disaster. Some things are implemented in the emergency response period:
  - *Early Recovery*
  - Supporting for coordination, study, and rehabilitation activity planning and reconstruction
  - Fulfilling of basic needs activity
  - Recovery social life and community activity
  - Recovery activities to the Sector that have social service function, such as health and education facilities

- **The post disaster period** is the time of activity implementation in the entire sector for recovering the situation back normally. There are activity implementations in the post disaster period with stages of long-term and stages of short-term.
Some activities which are implemented in the post disaster period:

− Rehabilitation activity, social and public infrastructure reconstruction, such as: road, bridge, irrigation, drainage, school, hospital, etc.
− Construction of housing facilities
− Giving technical assistance and capacity building in all sectors, especially to realize back to normal activity, including economy activities.

One of the significant recovery aspects is the economy factor in production, industry, and trade as acceleration of recovery activities in the city. In the recovery factor of the local economy is needed the financial supporting as an initial capital to return the factor of goods or service. Policy formulation that encourages the economy recovery such as the regulation instrument of financial or banking are considered through the medium and small enterprises (UMKM). There are estimated 95.439 medium and small enterprises (UMKM) that are stricken by earthquake effect on the 2006. The loss potentials that are posed from non-performing credit cause the earthquake is about 1,5 trillion rupiah.

There is a policy issued by Bank Indonesia after the earthquake disaster. It is to recover economy for medium and small enterprises (UMKM) through the program regarding banking loan:

− rescheduling
− reconditioning
− restructuring

Based on the research, there is a conclusion that the micro-finance gave a role contribution that is more constructive in the recovery process of post disaster.

The policy formulation of handling post disaster recovery in housing sector is the housing stimulus for:

− The housing funding as much as 30 million rupiah/unit
− Giving discretion for the community in determine of housing type, with minimum requirement is 36 m² for the building area
− The large of area for each the house is 100 m², plus for public and social facilities are 50 m², totally 150 m²/unit.
− The building construction shall comply the criteria, such as the requirements of earthquake resistant structures, and also in the implementation must be conducted by mentoring.

The determination of policy is very situational and conditional, such as the housing policy in Mount Merapi eruption recovery is different with earthquake recovery. The housing policy formulation caused eruption considers area stability and security, take into account the eruption that take place in some time.
Recovery after the eruption of Mount Merapi are implemented from budget in 3 years with the assumption that:

- Housing recovery within 2 budget years and the completion of infrastructure development at the last 3 budget years
- Recovery of the public infrastructure are implemented gradually during the first year, by giving priority on the main infrastructure development to conduct basic services in the new settlements
- Social recovery are prioritized from budget in the first and second year, along with relocation of settlements program, it is continued by capacity building activities within three budget years.
- Productive economic recovery is prioritized in first and second years, along with the relocation of settlements program. It is continued by capacity building activities until budget in third year
- Recovery of across sectors is prioritized in the first year, to restore the function of public service and prevent more damage for environment component until third year.

Development program for recovery of the housing and infrastructure sector are synergized with human resource development. Some activities are implemented intensively (cash for work). This activity is intended for people to start environmental recovery settlements include to repair the most basic infrastructure and to earn salary.

Understanding aspects of environment are included in the housing and environment recovery such as the inorganic waste management in relocation settlements area using the waste bank. Inorganic waste that has been sorted out is collected in the bank and will be taken by collectors when it is quite enough. The waste management group is able to reap income from the sale of inorganic waste. Waste management activities in this area if it is performed consistently become source of income and opportunity activities of the victims of disasters.

6. The Resilience of Disaster Risk and Local Wisdom

Resilience to the risk of disaster in community is highly dependent on the values of attitudes and manifests in local wisdom of the community. Today the communities of Yogyakarta despite being urbanized, but still embrace of social values and culture that is still preserved. The values are related to socio-cultural and historical character and culture of the area. The forms of local wisdom in handling and implementation of disaster recovery become the entrance of policy formulation that has greater power achievement of targets.
• **Mutual Cooperation (Gotong Royong)**
The value of social capital in the community which becomes potential in Yogyakarta is mutual cooperation. At normal conditions, the spirit of mutual cooperation is realized in social activities, social interaction, and the implementation of development environment.
At the time of a disaster, the rescue and recovery measures will be implemented and achieved well by utilizing aspects of value of local wisdom such as mutual cooperation. The communities cooperate and recover together, repair, and rebuild from the impacts of disaster.

• **Perlindungan Masyarakat – Linmas (Community Protection)**
At area of the smallest communities in the villages, the value of local wisdom is combined with an institutionalized of environmental preparedness in units of Linmas. The personnel of Linmas are in the coordination with the local government agencies (village and sub-district). Preparedness of Linmas is aimed at handling the community protection services, security, and management as well as disaster rescue.
Linmas Unit is very easy and moving quickly of command which is formulated at the region level at the discretion of the local government area. The personnel is taken from the local village communities that are already known and familiar with the local community. It is facilitates the consolidation and mobilization deployment of personnel, especially when handling the disaster.

• **Group of Community**
A group of community has a concerned, including those concerned with disaster preparedness. Experience of facing disaster that is happened, make the existence of a strong community is increasingly and actively implement the activities.
In facing disaster management, there is some communities’ disaster preparedness. The groups which concerned for telecommunication support such as Pare Anom community, area-based preparedness groups like Code X, and some other communities. Contributions and communities action is quickly and become partners of local governments to deliver on the information, policies, and disaster management directly to communities.

• **Regional Disaster Management Agency / Badan Penanggulangan Bencana Daerah (BPBD)**
A catastrophic event that is happened, open our insights that preparedness in terms of prevention and mitigation is not enough through coordination only. The implementation of these assignments need to be instituted in one organization that has ability to command and operational of handling, from the planning aspect up to implementation activities of the recovery. Yogyakarta City has increased the coordination of disaster management unit into the formation of the Regional Disaster Management Agency/Badan Penanggulangan Bencana Daerah (BPBD) has direct command of the disaster management mobility and capability of personnel and budget of emergency services budget.
7. Living in Harmony

Yogyakarta City in this decade is affected by natural disasters and not directly as epicentrum of natural disaster within the city. These incidents provide a meaningful lesson in cultural, social, and community. The communities are difficult to move from their homes even though the area is danger and has disaster risk. There are many certain values and beliefs as well as other non-technical considerations so that they don’t want to move from their original residence. Every location of residence has its own character and including all potential risks. Many experience when harmonize with terrible events, giving many lesson that human beings should be able to recognize the condition of the natural surroundings. A comprehensive introduction provides the knowledge to recognize the condition and able to overcome disaster. Where people living and have activities in such condition, formed the concept of living in harmony in the community.

Strengthening of the community to live in disaster-prone areas is supported by continuous training process such as disaster response simulation. The activity was not done just by the government itself, but the initiative of citizens and community groups that aware disaster response is having great effect in increasing the capacity.

Rehabilitation and reconstruction process is very quick, proving Yogyakarta City and Central Java community are very resilient in facing the disaster. The most visible fact is economic activity already recovered back to normally; even though the damage caused by the earthquake that shook for 57 seconds is a very excessive.

To achieve strong and responsive community disaster there are 4 things that should be enhanced:

- The anticipation of danger
- Fight or avoid disaster
- Adapting to disaster risk
- Recover quickly

The Personnel of BPBD and Linmas cooperate to recover the public infrastructure and urban facilities under one command.

Indonesian National Army to help the recovery of disaster management in city.
Disastrous events wouldn’t make the community of Yogyakarta collapsed. Instead of the disaster gives wisdom to rise up the ability and willingness of the community. Every disaster events makes lessons to build a better life. This is in accordance the principle of rehabilitation and reconstruction is Building Back Better.

People understand that living at peace with nature and natural events and activity can be enjoyed safely as long as able to overcome obstacles and threats. Communities within a group have joined together forming attitude of disaster preparedness and act collegially. The threat of natural disasters will be solved together collectively. Lessons learned are still needed strengthening local wisdom to support mitigation, social solidarity and an increase adaptive capacity to the victims of terrible events.