THE IMPORTANCE OF EFFORTS OF MANAGING NON-NATURAL HAZARDS IN INDONESIA

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The Maritime country of Indonesia which lies on the triple junction of the world's mega tectonic plates, ring of fires, also "the eguator emerald', brings the blessings of fertile soils together also with many natural hazards such as earthguake, tsunami, volcanic eruptions, landisides and other combuned hidro-meteorological hazards. The stable economic growth of Indonesia needs to increase and therefore, the country need resiliences towards the potency of natural and non-natural hazards, such as pandemi, technology failure, social conflicts and also nuclear, biological and chemical. Either natural and non natural catastrophes are managed by National Disaster Management Agency (BNPB) based on Law number 24 Year 2007 on Disaster Management. Disaster Management consisting three phases such as mitigation, emergency response and rehabilitation and reconstruction need huge seriousness and mitigation is the most important. One of mitigation efforts is to transfer risks to other special party having higher capacity such as insurance companies in the forms of disaster Risk

Financing in Insurance (DRFI). Methods used in this research is gualitative using various data resources and literatures.

Keywords: Natural Disasters, Non Natural Disasters, BNPB, DREI

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1. BACKGROUND

Being located on the triple junction of mega tectonic plates, Indonesia is considered as a fertile country and at once prone to natural disasters such as earthguake, tsunami, flood, landslides and other hidro-meteorological disasters. Many natural disasters have occurred in Indonesia. Remember that both mount Krakatau eruption and mount Tambora volcanic explosions gave significant impacts to the eguilibrium of the nature. Both volcanic explosions created tsunami waves which killed many victims at that time. However, their explosions were still small compared to Mount Toba explosion occure around 15,000 years ago, Mount Toba explosion considerd as the biggest volcanic explosion ever. The volcanic ashes consisting the toxic materials covered most skies all over the world for some time resulting temperature — dropped — for many years. It changed the world climate for several years !

Another big earthguake struck Indonesia was on Padang on 30 September 2009. The epicenter was 7.9 richter scale struct the city. The financial loss was up to Rp 20 trillions.

Several previous paragraph tells us that many natural disasters occurred in Indonesia and it wasted Indonesia's economic potency being collected for some years. Table 1 below shows nine biggest natural disasters in Asia and two of them are form Indonesia.

Table 1. Nine biggest natural disasters in Asia (1998 — 2006)

Negara Bencana Tanggal Jumlah Kerusakan Kerusakan & Korban & kerugian (juta Tewas kerugian US$,harga(jutaUS$) konstan 2006)

Turki Gempa Bumi 17 Agustus 1999 7127 8.500 10.281

Indonesia (Aceh) Tsunami 26 Desember2004 165.708 4450 4747 Honduras Topan Mitch 25 Oktober—8 14.600 3.800 4.698 November 1998

Indonesia (Yogya- Gempa Buni 27 Mei 2006 5.716 3.134 3.134 Jawa Tengah)

India (Gujarat) Gempa Bumi 26 Januari 2001 20.005 2.600 2.958 Pakistan Gempa Bumi 8 Oktober 2005 73.338 2.851 2942 Thailand Tsunami 26 Desember 2004 8.345 2.198 2.345 Sri Lanka Tsunami 26 Desember 2004 35.399 1454 1551 India Tsunami 26 Desember 2004 16.389 1.224 1.306

Sumber: Pusat Kesiapan Bencana Asia (Asia Disaster Preparedness Center), Thailand: ECLAC, EM-DAT, Bank Dunia

Picture 1. The seven biggest volcanic explosions in the world

As Indonesia has around 127 volcanoes and most of them are still active, Indonesia is prone to volcanic epxlosion hazards. Picture 1 shows that the three biggest volcanic explosions have occurred in the wold are from Indonesia and Mount Toba ranked number one. In 20th centuty, exactly on 26th Desember 2006, a 9.0 richter scale tectonic carthguake hit Nangro Aceh Darussalam province and resulted a huge tsunami wave that killed more than two hundred thousands people died there and many more died in neighboring countries. Another earthguake occurred in Central Java on 27 May 2006 resulting many people died dan many buildings and infrastructures were heavily damaged, resulting around USD 3,1 billions (eguals Rp. 29,1 trillions) financial loss.

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Apart from those earthguake disasters, many other natural disasters have occurred in Indonesia, such as floods, landslides and others. These become a wake up call for Indonesia governments. In 2007 therefore, Indonesian government launched the Disaster Management Law number 24 Year 2007. This law is intended to regulate and manage the disaster mmangament in Indonesia. The law recoginzes that there are 14 types of disasters, ranging from natural disasters and non natural disasters. This law also gives an exclusive mandate to the government body called The National Disaster Management Authority — (Badan — Nasional Penanggulangan Bencana). BNPB is a special government authority functioning to command, execute and coordinate any matters related to disasters occuring in Indonesia. The interesting thing on this law is the types of non-natual disasters as mentioned in this law, ie industrial failures, zoonosis, industrial catastrophe matters and social conflicts. Since the law was launched in 2007, the handling and management of disasters in Indonesia have become better and better. Many proofs shows BNPB has received many International awards and recognitions. Most efforts and plans have been put on handling natural disasters while there are not many specific plans on national non-natural

ISSN : 2467-8766 disasters handling and efforts so far. Ranked as the fourth largest population country and a country with astable economic growth, Indonesia is also prone to non-natural disaster exposures. There are many industrial areas producing dangerous and toxic chemical substances all over Indonesia. If such manufacturers hit by disasters resulting the damage and loss of those chemical substances to the environment and people living nearby, there will be a potential big loss and damage due to non-natural disaster events. These kinds of disasters once happened in other countries which we can therefore draw lessons from these. Due to scarcity on this event, this research is intended to focus on the importance of managing non-natural disasters potency in Indonesia

1. NON NATURAL DISASTERS, HIDDEN CATASTROPHE

As explained above, non-natural disaster potency are a timing bombs if we do not manage and handle them carefully. The disaster potencies may be greater and longer than those of natural disasters. Bhopal tragedy would be a good example to show that industrial disasters caused big damage and losses to human life. It was an industrial accident occurred at Union Carbide Plant producing pesticide and located in the city of Bhopal India. Due to poor maintanance, pipe corrotion and over storage, on the night of 2 — 3 December 1984, the plant accidentally released around 40 tonnes toxic methyl isocyante gas and flooded the city, resulting the great panic to the people woke up in the morning since the felt their lungs “burned”. Thousands people died due to the effects of such gas. The immediate death were around 2,259 and estimated 8,000 died within two weeks. As a result, 25,000 people died and 500,000 people were injured and might have long term health problems. Union Carbide had to pay around US$ 470 millions as compensation to the city of Bhopal.

Another big non disaster event was Chernobyl tragedy. It occurred at city of Pripryat, northern Ukranian (part of Sovyet Socialist Republic). It occurred on 25-26 April 1986 at one light water graphite moderated reactor at the Chernobyl Nuclear Power Plant. The event occurred during a safety test at night which failed. This eventually resulted in uncontrolled reaction conditions. Water flashed into steam generating a destructive steam explosion and

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a subseguent open-air graphite fire. This fire produced considerable updrafts for about nine days. These lofted plumes of fission products into the atmosphere. The estimated radioactive inventory that was released during this very hot fire phase approximately egualed in magnitude the airborne fission products released in the initial destructive explosion. Practically all of this radioactive material would then go on to fall-out/precipitate onto much of the surface of the western USSR and Europe. At the time of accident two workers death due to explosion and radiation. Fourteen people died on the coming days after the day of the explosion. Fifteen children died due to tyroid cancer several years after being contaminated radiation. Some relevant bodies, including United Nations, took preventive program actions from the re-occurrence of the nuclear tragedy.

Another kind of non natural disasters are epidemic or pandemic diseases. The Ebola epidemic is One of those examples. Ebola virus disease (FVD), also known as Ebola hemorrhagic fever (EHF) or simply Ebola, is a viral hemorrhagic fever of humans and other primates caused by ebola viruses. The disease has a high risk of death, killing between 25 and 90 percent of those infected, with an average of about 50 percent. This is often due to low blood pressure from fluid loss, and typically follows six to sixteen days after symptoms appear.

The first known outbreak of EVD was identified only after the fact, occurring between June and November 1976 in Nzara, South Sudan (then part of Sudan), and was caused by Sudan virus (SUDV). The Sudan outbreak infected 284 people and killed 151. Some outbreaks occurred several countries in Africa, such as the Ebola outbreak in Zaire (now the Democratic Republic of the Congo) in 1995 resulting 315 affected and killed 254. In 2000, Uganda had an outbreak affecting 425 and killing 224, in this case, the Sudan virus was found to be the Ebola species responsible for the outbreak. Other similar epidemic diseases are such as bird flu (known also as Avian flu). Bird flu is similar to swine flu, dog flu, horse flu and human flu as an illness caused by strains of influenza viruses that have adapted to a specific host. When a bird flu outbreak occurs, it does not only kill people but also result economic potency loss as people scare to visit the country affected by bird flu outbreak.

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Shreve dan Kelman (2014) on International Journal of Disaster Risk Reduction studied the economic effectiveness of Disaster Risk Reduction (DRR). The price of goods rises and so does the disaster cost. It gets worse when the disaster caused huge economic losses as we know the magnitude of disasters may become unpredicable. Therefore, as the state budget cannot cope with the disaster costs, some efforts should be put into action. It is a thing called mitigation or widely known as Disaster Risk Reduction. — DRR can save huge amount of money compared to those of disaster emergency costs. The World Bank guotes that every $ 1 invested on DRR effors can save $ 7. This 7:1 ratio continues to be used till today. The USGS calculated that a predicted $400 billion economic losses due to natural disasters can be reduced by $280 with a $40 billion investment in prevention, mitigation and preparedness strategies (Dilley : 1995). Some mitigation programs effective to reduce the financial impacts due to disasters are such folows:

1. Early Warning System

Creating early warning system (EWS) can reduce damage and losses potency significantly. For instance, installing a tsunami sirene along the beautiful coasts visited by tourist may be useful to help evacuation process when a tsunami hot the area. The similar EWS can also be installed in the area prone to other disasters such as floods, typhoons, landIside and the like.

1. Building infrastructres In line with EWS creations as above, building a tsunami shelter can be very useful during the tsunami especially when tourists were seeking the places of height for their safety.
2. Public Private Partnership

Abbreviated as PPP, Public Private Partnership (PPP) is helpful, especially when the money and budget become issues. As we know that disaster is everybody business whih means that many stakeholders are involved when the disaster happens. They are people, governments, private sectors, academicians and sometines neighboring countries or even international countries worldwide. They can donate some money for mitigation or disaster emergency situation. Taking the previous case, when the local state government

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do not have some money to build a tsunami shelter, the state can borrow some money from other parties or often the private sectors or NGO bodies can donate some fund for building of such tsunami shelters, It is what we call as PPP.

1. Capacity Building

Taking the same situation as above. When the tsunami shelter is already built, is is also important to do capacity building for community living in disaster prone area. It means that a kind of disaster awarness program should be disseminated to such community. The program includes the tsunami drills carried out regulary and all stakeholer should participate during the drills. Every impertfect drill must be reviewed for better improvement on the next drill.

Those four programs above are parts of DRR and these are most successful kinds of efforts practiced around the world.

1. CONCEPTUAL FRAMEWORK

The above discussions tell us that when such non natural disasters accident occur, the damage and loss can be catastrophic, even more than such of natural disasters event. We know that there have been very little EWS (Early Warning Systems) created for non natural disasters. The event can occur at local state but could spread out widely to neighboring countries. Similar causes may result differently depending the mitigation systems specific in place, regulation the willingness of the people involved. It is of course different handling when the bird flu occurs in rich country compared to th poor country. The rich country will have better disaster management system than the poor country.

Considering such, the conceptual framework to overcome the potency of loss or damage due to natural disasters should be based of such occurrence from the past, what we learn and how we make some concepts to prevent such disasters from reoccurence. They are listed as follows:

1. Disaster Risk Reduction The DRR programs as mentioned above are such installing EWS in area prone to disassters. However such EWS are not so many for non

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natural disaster events. They are very difficult 4. SUMMARY AND RECOMMENDATION to creat an EWS for Ebola pandemic viruses. The

only nearest thing to do is to raise alert flag Having considered the previous discussions soonest. The PPP efforts are also important to and explanations, we cansummarize as follows: create a sinergy and cooperation among

stakeholders, ie public private partnership. This a. Indonesia is prone to the potency of both natural DRR programs should be carried out in many parts disasters and non natural disasters. The statistic in Indonesia. Remember that there have been shows that big natural catastrophe events many big industries operates in Indonesia which occurred in Indonesia such as the ancient mount have become potencies of industrial disasters. Toba explosion, Aceh Tsunami (2004) or Jogja Also, we know that Indonesian people consume Earthguake (2006) and Padang Earthguake chicken meats and this may be prone to bird flu. (2009).

Last but not least, the non disaster awareness

as part of capacity building should be disseminated b. Indonesia should be aware to non natural to people living the industrial plants. disasters potencies. There many big industrial In addition to it, some non-disaster drills should plants and manufacturers operate in Indonesia be exercised regularly. producing also large amount of hazarduous

materials endanger community. b. International safety regulation

Taking examples of Bhopal tragedy or c. There are not many efforts in mitigation Chernobyl tragedy, the safety, maintanance and programs of non natural disasters in Indonesia human mistake are the most caeses of such although the kind of non natural disasters are tragedies. Therefore, some efforts on safety mentioned in law number 24 year 2007 on factors are must. The safety regulation on Disaster Management. This may become time prevention of non disaster occurrence in industries bombs if we do not handle these issues carefully. should be created and obeyed locally and internationally. — The safety precautions and As the recommendations to manage the non strict maintenance programs should be a natural disaster potencies in Indonesia are such non-negotiable standar adapted for industries follows: producing hazardous materials endanger human life. All the industrial safety regulations should a. It is reccommended that Indonesia should carry follow ISO standards for reguirements. out DRR programs throughout Indonesia. Such

programs are not limited to EWS, PPP, building c. Enforcement infrastructures and improve capacity building for

The last thing to do is how to apply the law community living in prone areas. enforcement when the above two programs do not run as expected. This become the vital issue for b. It is recommended that Indonesia should government, ie to punish the industy that disobey cooperate with other organizations the safety rules endenger the workers and internatiomally to cope with the improvements community. Not only that, the government should of DRR for non natural disasters. This is also give rewards to industries that follow the important as not many efforts exist for non safety regulations regularly and take continuous natural disasters comparing to those for natural efforts to improve the safety procedure. disasters.

Those three concepts should be run c. Law enforcement may become important as part simultanously to manage the loss or damage of mitigation. — Rewards and punishments potency due to non disaster catastrophe. program applied for industrial practices should

be created and monitored and evaluated regularly.

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