

MITIGATION SOCIALIZATION MODEL OF THE SOCIETY ON DISASTER SUSCEPTIBLE REGIONS IN WEST JAVA

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Indonesia merupakan daerah yang rawan terhadap bencana, baik bencana alam, sosial maupun kegagalan teknologi. Oleh karena itu mitigasi sebagai upaya dan kegiatan yang dilakukan untuk mengurangi dan memperkecil dampak bencana harus disosialisasikan secara tepat dan cepat. Tujuan penelitian ini adalah untuk mengetahui (1) karakteristik kebencanaan dan budaya masyarakat berkaitan dengan mitigasi bencana, (2) mengkaji pemahaman masyarakat di daerah rawan tentang bencana dan penanggulangannya. (4) memetakan kebutuhan masyarakat daerah rawan akan tentang sosialisasi mitigasi bencana. (5) menyusun model hipotetik sosialisasi mitigasi bencana

Penelitian dilakukan di Jawa Barat dengan mengambil 5 daerah sampel yaitu Sukabumi, Garut, Ciamis, Cirebon dan Bandung. Jumlah sampel masing-masing daerah 30 orang yang diambil secara purposive sampling, sehingga jumlah totalnya 150 orang. Data primer diolah dengan persentase. Selain itu dianalisis pula data sekunder dari berbagai dokumen.

Jawa Barat merupakan daerah yang kerawanannya termasuk tinggi. Frekuensi bencana lebih dari satu dalam setahun, sumber bencana relatif dekat, struktur demografi yang padat dan usia non produktif tinggi, beban tanggungan tinggi, kualitas bangunan rendah, kemampuan mobilitas secara mandiri rendah, tingkat pengetahuan dan pemahaman tentang kebencanaan rendah. Ketidakmampuan meliputi kemiskinan, pendidikan rendah, penguasaan teknologi terbatas, membuat peluang untuk mencari alternatif kehidupan yang lebih baik makin terbatas.

Pemerintah yang diwakili oleh Badan Penanganan Bencana ataupun hasil kerjasama dengan instansi terkait, mengembangkan materi sosialisasi kebencanaan yang meliputi tata ruang, peta daerah rawan bencana, jenis dan gejala terjadinya bencana, mitigasi bencana, peta evakuasi, peta potensi kerentanan di daerah rawan bencana, SOP penanganan bencana, sistem informasi (*early warning*), dan buku bencana serta mitigasinya, Informasi tersebut disosialisasikan melalui penataran, pelatihan, pendidikan, bahan cetak (buku, pamphlet, brosur), media komunikasi TV dan radio. Setelah sosialisasi perlu ditindaklanjuti dengan pelatihan-pelatihan secara khusus mengenai cara penyelamatan diri melalui simulasi atau gladi, agar pengetahuan dan keterampilan tersebut tetap terpelihara. Peringatan dini, selain melalui TV dan radio, tokoh masyarakat pun dapat menjadi informan yang dianggap efektif..

A. Background

Indonesia is susceptible to disaster because it is geologically located between plates of Asia, Pacific, and Australia. Geographically, it is an archipelago and maritime country. Its population is both demographically huge and sociologically not distributed evenly as it is multicultural and multiethnic country. Many of its citizens are both pedagogically low in education and economically less developed.

Disaster may be happened either suddenly or in gradual process. Earthquake is a sudden natural disaster while volcanoes, drought, flood, and hurricane are predictable disasters as they can be predicted by seeing several factors. Human-made disasters such as flood, landslide, drought, forest fire, pollution, and other technological failure, as in the case of Lapindo Mud and the leakage of nuclear factory, happen because people do not wisely exploit the natural resources.

Disasters are critical disturbances of social function as they cause huge loss on human life, whether in the viewpoint of economy, social order of society, or environment. Obviously, disasters had happened since long time ago. They are even concomitant with the process of earth forming itself. They will not cause many problems if they are taken place on uninhabited areas, whereas if they are occurred in an area with many inhabitants, they are considered great disaster. As disasters have caused several sufferings and disadvantages, disaster-handling management or called disaster mitigation is emerging.

Mitigate means actions to decrease danger in order to minimize the disadvantages of disasters. According to No. 131, 2003 Decree of Indonesian Minister of Home Affairs, mitigation or domestication is an effort and action to decrease and minimize several effects caused by disasters. The effort includes preparedness and awareness. Mitigation is everyone duty, whether the experts, government, or whole citizens. Recognition and understanding of disasters such as knowing their process and assessing their level of danger are the tasks of several experts such as volcanologists, hydrologists, climatologists, cosmologists/astrologists, seismologists, geologist, and educational and social professionals. The understanding, knowledge, and preparedness should be

socialized to the society in order to make them able to anticipate, overcome, and minimize the disadvantages as early as possible.

This research purposes on developing socialization model of disaster mitigation to the society in susceptible regions of in West Java. Specifically, the purposes are to (1) describe disaster characteristics in susceptible regions of West Java, (2) describe society culture characteristics related to disaster mitigation of susceptible regions, (3) examine society knowledge on susceptible regions about disaster along with the way to overcome it, (4) map out the society on susceptible region about socialization of disaster mitigation, and (5) arrange socialization hypothetic model of disaster.

B. Literature Review

1. Indonesian Susceptibility of Disaster

Indonesia is susceptible to disaster because of several factors as follows:

- a. Indonesia has tropical climate that catch monsoon and trade wind every year. In the transition periods between monsoon (*pancaroba*) particularly in dry season, entering the rainy season, there are frequently (a) Thunderstorms or heavy rain with thunder and tornados. (b) Cyclone wind is a wind circulating into the center of lower or minimum (-) air pressure. (c) Anticyclone wind is a wind circulating out from higher or maximum (+) air pressure. (d) Tropical cyclone is called Typhoon in North West Pacific, whereas in India and Australia, it is called cyclone. Such tropical cyclone characterized with a hole inside it, is called Hurricane. (e) Convergent region are the place in which two foul wind meet then move upward. In the tropical regions, there is blowing northeast and southwest trade wind from the opposite direction and collide around the equator.
- b. Geologically, Indonesia is a rallying point between two world's mountain lines, Mediterranean from Europe and Pacific America. The two lines gather in Indonesia, exactly in Banda Sea. Mediterranean line enters through Sumatran Island forming inside and outside Bukit Barisan mountain line, whereas Pacific line moves from Japan to Philippine, Sulawesi, Maluku, and Papua. Because of this

rallying point of the two mountain lines, Indonesia is rich in active volcanoes. The number of volcanoes in Indonesia is around 129 by 70 of them frequently erupt.

- c. Indonesia is located between the plate of Indies, Asia, and Pacific. According to plate tectonic theory, a number of potential energies are piled up in the sub-ducted zone that if the pressure is to such a big, the pressure will be given up and cause an earthquake or seism. Indonesia is one of countries that frequently stricken by tectonic and other earthquakes because it is surrounded by sub-ducted zones. Some of regions that frequently stricken by the earthquakes are Northern coast of Papua, Middle Sulawesi and North Sulawesi, Nusa Tenggara, southern Java, and Western Sumatera. There are landslide and *Tsunami*, on the coastal area, along with the earthquakes.
- d. Indonesia has solid reliefs from its mountain, volcanoes, hills to its highland. Regions with high slope and high fall of rain may cause landslide. The more population, the more demands on settlements and farmed out lands. Utilization of marginal lands such as forest and land with high slope make Indonesia to be susceptible to landslide.
- e. Indonesia is a water country as it has seas, lakes, or rivers. Because of several factors comprises forest denudation in upper course area, constriction in river sketch caused by precipitation, settlements, garbage dumping, etc. cause their capacity limited. Lowland regions, particularly river rallying point, and overpopulated regions are susceptible to flood.
- f. Limited technology mastery and low society awareness on the importance of conserving environment and triggered by poverty as well, technology application failure frequently cause several disaster in Indonesia, such as forest fire, drought, epidemics, inter-ethnic conflicts, hunger, and other social disorders.

According to *United Nations-International Strategy for Disaster Reduction (UNISDR)*, dangers are divided into five groups as follows: (1) Danger in geological aspect includes earthquakes, *Tsunamis*, volcanoes, and landslide; (2) Danger in *hydrometeorological* aspect consists of flood, drought, typhoon, and high wave; (3) Danger in biological aspect comprises epidemics, pests, and plant diseases. (4) Danger in technological aspect

includes transportations accidents, industrial accidents, and technological failures; (5) Danger in environmental aspect covers forest fires, environmental damages, and water pollution. Natural disasters characteristics happened more in Indonesia according to BAKORNAS (2005) are flood, landslide, drought, forest fire, typhoon, earthquake, tsunami, volcano, technological failure, and epidemic.

B. Disaster Mitigation: Action to Decrease Risks

Disaster mitigation is a term used to refer all actions to decrease effects of a disaster that may be done before it happens, including preparedness and actions to decrease low term risks. Disaster mitigation comprises both planning and implementation of actions to decrease risks related with dangers caused by known human and natural disaster, as well as planning process to respond a real happened disaster.

Several factors may cause big loss of disaster: (1) low understanding of disaster characteristics or hazards; (2) action and attitude that may cause the vulnerability of natural resources quality; (3) less information of early warning that cause unpreparedness; and (4) inability to encounter dangers. It is, therefore, important to plan practical and systematic program to describe disaster characteristics (Coburn, Spence and Pomonis, 1994) that consists of understanding about (1) how the disaster happen; (2) the possibility of how the disaster happen and in what quantities; (3) mechanism of physical damage; (4) the most vulnerable elements and activity of the disaster effects; and (5) the consequences of damages.

Mitigation efforts may be carried out before, in time of, or after the disaster. Mitigation conducted before disaster is preparedness or an effort to give people the explanation to anticipate disaster by giving information, increasing preparedness as if the disaster happens, planning several ways to decrease disaster risks. Mitigation conducted in time of the disaster is direct response that is an effort to do at once when the disaster happen in order to overcome the causal effects, particularly include rescuing victims and properties, evacuation, and refuge. Mitigation conducted after the disaster is rehabilitation and reconstruction.

C. Preparedness

Preparedness is an effort to anticipate disaster through organizing effective and efficient steps. According to Randolph Kent (1994), disaster preparedness covers “assessing and decision making through prevention actions toward disaster.” The assessment and prevention process includes knowledge about the indications of disaster, early indication of disaster, development and regular examination of early warning system, evacuation planning, and other action to take during the alertness period in order to minimize possible death and physical damage. Preparedness also comprises education and training of people, officials, special teams, policy makers, disaster handling standard, supply protection, and fund using.

Preparedness, therefore, purposes on minimizing loss through fast, effective, and efficient actions. There are items of disaster preparation framework (Randolph Kent, 1994:16), namely (1) Vulnerability review, (2) Planning, (3) Institutional framework, (4) Information system, (5) Resources base, (6) Early warning system, (7) Mechanism of training respond, (8) General education, and (9) Rehearsal.

Vulnerability review is an identification study of certain geographically susceptible regions. It is dynamic aspect to do continuously by updating available data, particularly society structure, available needs and resources, possible disadvantages such as physical damages, susceptible activities of damages, and consequences of the damages. This vulnerability data is foundation of planning and policy making to provide things needed as disaster happens. All of which should be made as a habitual action in planning institutional framework to monitor developments whether the infrastructural condition, socioeconomic, or people preparedness to encounter disaster. Coordination inter-institution and intra-institution is important in disaster preparedness both horizontally and vertically. “There are no standards to ensure effective coordination. Every plan will depend on traditions and government structure in any country. However, planning will be malformed in the absence of coordination.” (Randolph Kent, 1994:23). It is, however, most likely the shorter bureaucracy and specific bureau task, the more effective disaster handling. Developing disaster bureau should notice established and proper responsible based on capability. Task description should be clear as well.

D. Society Capability

According to the Laws of Number 24, 2007, disaster handling should apply the following principles, fast and appropriate, based on priority, coordinated and integrated, effective and efficient, transparent and accountable, partnership, capability, indiscriminative, and *prolertisi*.

Based on the laws, expert staff of Social Minister (2008) suggests the importance of society role in handling natural disaster as follows: (1) Efficiency, achieved result is more optimal by using available human resources, (2) Effectiveness, it is hoped that the alternative policy will accelerate the accomplishment of functional goals in handling disaster namely accuracy, velocity, and compatibility, (3) Continuity: society role becomes the continual program and activity as problems need continuous treatment.

Society capability to cope with disaster organizes as (1) utilization of local values and society knowledge related to overcome natural disaster; (2) utilization of knowledge and educational innovation to establish safety and endurance culture in all levels; (3) reduction of coverage of natural disaster risk; (4) mechanism of disaster treatment that includes reduction of natural disaster risks as both national and local priority, increase of local society understanding about disaster that will happen, formation of solid, coordinated, and effective organizer institution, provision and correction of early warning system, identification, review and monitoring of natural disaster, and escalation of preparedness to encounter disaster in all level of society in order to get more effective responses. In addition, disaster simulation should be conducted as well; (5) increase of society awareness to encounter disaster; (6) capability of society role to cope with disaster acquired from experiences (learning process from previous experiences); (7) responses of local government and its instruments of institution sector to establish society preparedness; (8) trained, organized, and coordinated local manpower (village/sub-district) to overcome natural disaster; (9) establishment of equal perception of disaster in social environment.

In order to ascertain the capability of society role in overcoming disaster, the following social policies should be developed: (1) intensification of knowledge and ability, (2) appreciation of society role in overcoming disaster, whether it is established

before, in time, or after disaster, (3) methods of society role capability in overcoming natural disaster as the formation of Laws no. 24, 2007 and Government Regulation no. 21, 2008, that is related with disaster treatment principles, the regulation of right fulfillment and liabilities implementation in overcoming disaster, and (4) actualization of role of other social institutions to be part of socialization campaign in society capability to overcome natural disaster.

C. Research Method

Method used in this research is research and development. The population is all people in susceptible regions in West Java. Sample of area is taken by purposive sampling on five regencies namely, Bandung, Sukabumi, Ciamis, Garut, and Cirebon. This sample is used because the five regions include in the disaster susceptible category. Bandung is susceptible to flood, landslide, industrial waste, and volcanoes. Sukabumi and Ciamis are susceptible to earthquake, tsunami, and landslide. Cirebon is susceptible to tropical hurricane. 150 respondents are chosen randomly.

Selected data are analyzed using descriptive statistic in form of average and percentage to analyze data obtained from questionnaire. Qualitative analysis is used to describe data from documentation and observation study.

D. Research Findings

West Java Province is dominated by Sundanese in which the people are very close to natural life. As it is located near or directly abut on Jakarta, West Java becomes the buffer zone of Jakarta development. It has large population distributed in several susceptible regions. The population has family charge more than three people in average that dominated by unproductive ages. Children and the old are the most susceptible to disaster. This situation becomes more serious by houses condition that most of them are built using vulnerable construction. Most of these houses are built without using construction made of good iron. The houses are about >50 meter square in wide. House condition affect on number of disaster victim. The houses considered as safe place do not precisely function well. It indeed may become secondary danger as they are susceptible

to fall out that could also become one of factors in increasing of victims during the disaster.

Most of the people do not have vehicles as instrument to mobilize other or things if disaster happens. They only have motorbikes that the capacity is more limited than their charge. This needs serious anticipation to provide vehicles if needed.

Except Garut and Bandung, most of the three other regions (more than 50%) are susceptible to natural disaster, more than once a year. Frequent disaster in Bandung is flood. Bandung is actually susceptible to water pollution as well, especially around textile factories. It is also susceptible to social conflict (that is latent), air pollution, and traffic jam. People frequently comment on disaster as natural disaster, which is experienced directly such as volcanoes and earthquakes. They ignore other disaster such as tsunami, fires, technological failure, typhoon, pollution, social disaster, which are latent.

Most of them know about disaster from mass media or chat with other, especially in recent years in which many disasters happened in Indonesia. Knowledge about disaster is generally low. Most of the people never get any counseling or especially training to rescue themselves when disaster happens. They also do not know other susceptible regions to disaster.

Based on the analysis of the needs of disaster information by the criterion of very important (4), important, (3) less important, and (2) not important (1) from 14 items given to the respondents. The result shows that most of the answers (>75 %) included in very important and important. The knowledge itself comprises several disasters, disaster indicators, cause of disasters, susceptible regions to disaster, disaster handling, and preparedness. It shows that socialization on knowledge and training should be provided in order to make people understand more on disaster. If they understand disaster very well through the appropriate source, they will be more ready to encounter disaster, whether to save their properties, help other, or rescue themselves.

Most of people have already the basic knowledge of disaster mitigation, especially volcanoes and tsunami, although the accumulation of the knowledge is considered minus. They do have knowledge about disaster mitigation particularly related to certain disaster on their region, as well as the evacuation place. They know about disaster by watching Television or chatting with other. High requirements of disaster information based on the

susceptible condition on their region should be realized as fast and comprehensive as possible in order to minimize the disaster risks, especially when the vulnerability of people is high. The knowledge socialization is conducted by providing courses, training, books, pictures, pamphlets, and other printed media that are glued on strategic places or given to every family.

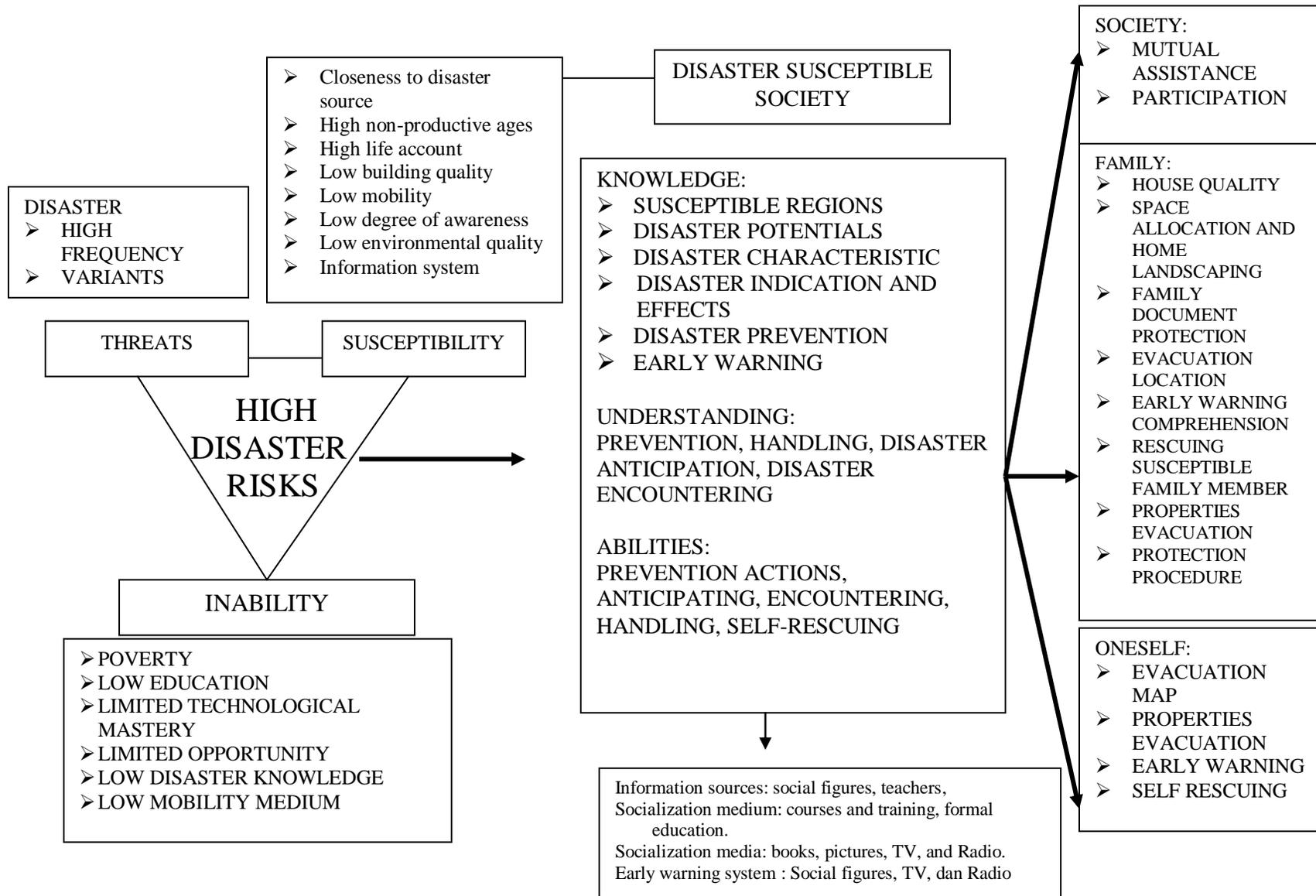
Social figures are considered the most efficient early warning source, either formal or informal. If RT, RW, and village chief include in formal source, the early warning will be more efficiently delivered rather than religious figures, teachers, neighbors, local and central government, or Geophysics and Meteorology Board (BMG). This shows that social figures are more trustworthy and capable to command their people if disaster happens.

On what degree is their ability to participate in overcoming disaster? All respondents respond that they are ready to participate. This shows high tolerance and social skills, even though their participation is based on their capability. Physical support is the most general assistance they could provide when disaster happens. Soon, they will provide foods, drinks, clothes, knowledge, and fund. Social self-supporting to overcome disaster could be mobilized anytime when disaster occurred. Mutual assistance in their environment is high and frequently established. In a region, which people work as industrial workers or employees as in Bandung, mutual assistance is seldom occurred, ascertained when instruction given. It is concluded that urban society has less attention to the mutual assistance or social care of their own surroundings. It causes limited self-supporting and materials donation (foods and drinks).

Based on the requirement analysis and society factual condition finding obtained from the research, mitigation socialization model can be seen in Diagram 1 and 2. Government either represented by Badan Penanganan Bencana (Disaster Handling Agency) or resulted from the collaboration with related institutions develops disaster materials such as layout, map of at risk regions, kinds and indications of disaster, disaster mitigation, evacuation map, map of vulnerability potential on at risk regions, SOP of disaster handling, information system (early warning), disaster books, and the mitigation. Those materials are socialized to social figures through courses and counseling. To students, they are socialized through education, particularly IPS in which geomorphic,

disaster, social changes, and conflict are given as subjects. Research findings shows that study of integrated and thematic IPS is the most relevant subject to discuss about disaster and its mitigation (Maryani dan Heliuss Sjamsuddin, 2008). Problem solving, demonstrations, simulations, lectures, and discussion are the most effective method to increase knowledge and understanding of disaster, whereas film media, pictures, and map are the most appropriate choose. Non-test evaluation is chosen to examine knowledge, understanding, and disaster-handling skills.

Diagram 1: Disaster Risks in Researched Regions



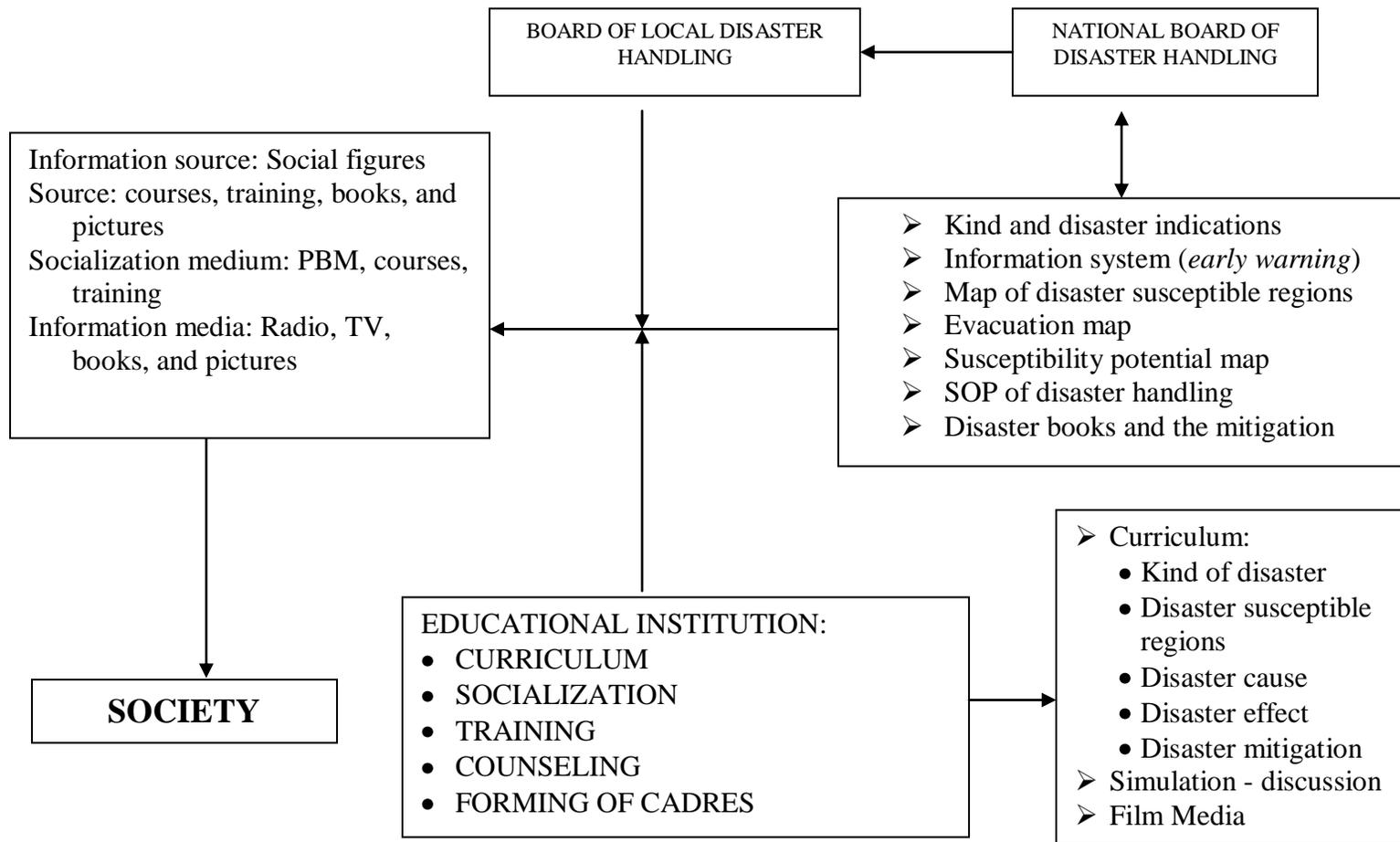


Diagram 4.4. Socialization Model of Disaster Mitigation

E. Conclusion and Suggestion

1. Conclusion

National authorized institution to investigate and analyze disaster indication is BMG. It informs BNPB (National Board of Disaster Treatment). BNPB makes coordination with other related institutions such as Bapeda, BPPT, PKLH, NAKERSTRANS, and educational institutions about management of disaster mitigation. The information will be simultaneously delivered to people and educational institutions based on their capacity and task.

In the sample regions, disaster risk is high because the disaster frequency tends to high and varied. The susceptibility of people is high as well, if it is seen from the closeness to disaster source, solid demography structure, high non-productive age, high account and risk of life, low quality of building, low mobility, and low degree of disaster knowledge and understanding. Inability that consists of poverty, low education, and limited technological mastery makes the opportunity to find better life alternative limited. Therefore, the knowledge, understanding, and skills of disaster mitigation should be upgraded. In the level of society, people have potential to establish mutual assistance and to participate in handling disaster. Socialization, therefore, could be set up through several ways, particularly by providing courses, training, books, pictures, and other printed media given to every family or glued in strategic places.

The government either represented by Badan Penanganan Bencana (Disaster Handling Agency) or resulted from the collaboration with related institutions begins the development of socialization materials of disaster such as layout, map of at risk regions, kinds and indications of disaster, disaster mitigation, evacuation map, map of vulnerability potential on at risk regions, SOP of disaster handling, information system (early warning), disaster books, and the mitigation. Those information are socialized through courses, training, education, printed materials (books, pamphlets, brochures), and communication media such as television and radio. In addition, the socialization should be followed up through particular trainings of self-rescue by using simulation and rehearsal in order to maintain such knowledge and ability.

2. Suggestion

According to the research findings, especially by seeing current social condition in susceptible regions, it suggests

1. Government:

- Should be stricter in giving building permission letter to preserve the environment as well as to avoid its further damages;
- Should carefully view the technology and condition of related region in giving trading certificate, either for cultivating land or for other business;
- Should socialize regional layouts such as river flood plain, coastal area, areas with high slope, and open green areas as evacuation place, based on the vast, number of population, and residential density.
- Should overspread disaster susceptibility map, disaster mitigation, and effective and efficient early warning system by using several media;
- Should put disaster materials into local content curriculum for susceptible regions;
- Should have updated demographical database to anticipate and give help society in susceptible regions;
- Should ensure Sakorlak (Implementation Coordination Unit) in every susceptible region to provide both principle commodities and standard to encounter emergency.

2. Society

- Should maintain mutual assistance and social solidarity;
- Should be wise in building houses, utilizing land, and preserving environment so that changing in modern culture and lifestyle do not omit the local wise;
- Should be selective and adaptive in determining house location, building quality, and space allocation in house to avoid risks if disaster happens;
- Should glue disaster mitigation, early warning, and evacuation map in strategic places;
- Should keep properties and documents in reachable place, easily to pack, and ascertainable to any trustworthy family member;

- Should understand protection procedure either to the susceptible family or to themselves.

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