

## THE EFFECTIVENESS OF FIRE DISASTER MITIGATION TRAINING IN SURABAYA REGIONAL DISASTER MANAGEMENT AGENCY

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### ABSTRACT

This study aims to analyze the effectiveness of the Surabaya City fire disaster mitigation training, the inhibiting and supporting factors in the fire disaster mitigation training and the efforts made by the Surabaya City *BPBD* in overcoming obstacles in the fire disaster mitigation training. The research method used is descriptive qualitative. Sources of information were determined using purposive sampling techniques, data collection techniques through library studies, interviews and documentation as well as data analysis techniques by data collection, data reduction, data display and drawing conclusions. The results of the study show that: (1) The effectiveness of fire disaster mitigation training at *BPBD Kota Surabaya* is categorized as quite effective. The study reveals high community awareness, participant satisfaction, and adaptation of trainers for fire disaster mitigation training. Factors affecting effectiveness include facilities, infrastructure, employee competency, SOP, and community participation. *BPBD Kota Surabaya* aims to improve effectiveness through competency certification, coaching, mentoring, and collaboration with other agencies.

**Keywords:** *Effectiveness, Fire, Disaster, Mitigation, Training*

### A. INTRODUCTION

Fire is one type of disaster that has the potential to leave large losses if it does not get sufficient attention and handling in disaster mitigation efforts. According to the *Undang-undang Nomor 24 Tahun 2007* regarding Disaster Management are included in the types of natural disasters as well as non-natural disasters based on the causes of their occurrence. This indicates that fire disasters, besides being influenced by physical or natural conditions, can also occur due to human negligence as the 3 causes. In disaster mitigation, in addition to the physical (natural) aspect, it turns out that the human (social) aspect must also receive special attention.

Fire is a threat to human safety, property and the environment. With the rapid development and progress of development, the risk of fire is increasing. The

increasing population density, the many constructions of office buildings, residential areas, and growing industries have created a hazard and in the event of a fire requires special handling.

The city of Surabaya is one of the urban regions with a population of 2,874,314 people. This number consists of 1,425,168 males and 1,449,146 females. Surabaya is the capital city of East Java with an area of 326.81 km<sup>2</sup> and a population density of 8,798 people/km<sup>2</sup>. With a dense population in an area, there will always be a greater potential for disasters. This is also reflected in the city of Surabaya as an area with a high population density.

As recorded in the 2021 Disaster Risk Index book, the City of Surabaya occupies the 6th position in the East Java Province disaster risk index value with a high ratio class in 2021. In the risk index, the level of disaster is assessed based on its constituent components, namely hazard, vulnerability, and government capacity in dealing with disasters. The assessment of the level of risk based on the potential loss above allows for the calculation of the achievements of a disaster risk reduction effort in an area. (Adi W, 2021)

Table 1 Disaster Index Data for East Java Province

NO	KABUPATEN/KOTA	2015	2016	2017	2018	2019	2020	2021	KELAS RISIKO 2021
1	PAMEKASAN	180.40	180.40	180.40	180.40	172.53	160.19	157.10	TINGGI
2	SUMENEP	204.80	204.80	204.80	204.80	184.62	160.35	155.93	TINGGI
3	BLITAR	210.00	210.00	210.00	198.06	178.37	160.26	154.75	TINGGI
4	JEMBER	219.20	219.20	219.07	198.80	182.18	158.19	152.63	TINGGI
5	TUBAN	175.20	175.20	175.20	175.20	160.38	145.00	150.74	TINGGI
6	KOTA SURABAYA	166.80	166.80	166.80	166.80	150.34	150.34	150.35	TINGGI
7	MALANG	219.20	219.20	199.81	142.10	137.09	133.20	146.98	TINGGI
8	PROBOLINGGO	194.00	194.00	194.00	162.29	156.70	141.16	139.18	SEDANG
9	MAGETAN	152.80	152.80	152.80	152.80	135.80	131.26	137.39	SEDANG
10	PASURUAN	214.00	214.00	214.00	214.00	180.34	156.26	137.01	SEDANG
11	JOMBANG	154.80	154.80	154.80	154.80	138.40	128.55	137.00	SEDANG
12	MADIUN	155.20	155.20	155.20	155.20	134.81	130.18	136.02	SEDANG
13	KOTA MOJOKERTO	142.80	142.80	142.80	142.80	133.95	120.57	135.88	SEDANG
14	LUMAJANG	231.20	231.20	200.76	129.74	123.84	117.76	134.73	SEDANG
15	NGAWI	143.20	143.20	143.20	143.20	131.06	119.98	132.30	SEDANG

Source: IRBI Year 2021

Disaster risk will decrease or increase with changes in these components. Therefore, the contribution of programs or activities related to reducing vulnerability or increasing capacity can be seen quantitatively in the form of reducing the disaster risk index. Periodic assessment of this risk index can become a tool for monitoring and evaluating the achievements of disaster management programs for a certain period.

According to the data, the fire risk index in the city of Surabaya is in the high category, ranking 192 out of 506 with a score of 25.81. The score is obtained from an analysis of the level of disaster risk based on data from disaster risk studies. Scoring is carried out in one district or city, then the total score indicates the vulnerability classification of that district or city.

Table 2. Fire Disaster Index Data

NO.	KABUPATEN/KOTA	PROVINSI	SKOR	KELAS RISIKO
168	TABANAN	BALI	28.29	TINGGI
169	BARITO KUALA	KALIMANTAN SELATAN	27.79	TINGGI
170	ROKAN HIJIR	RIAU	27.65	TINGGI
171	BANDUNG	JAWA BARAT	27.65	TINGGI
172	PURBALINGGA	JAWA TENGAH	27.65	TINGGI
173	JOMBANG	JAWA TIMUR	27.65	TINGGI
174	TIMOR TENGAH SELATAN	NUSA TENGGARA TIMUR	27.65	TINGGI
175	TAPIN	KALIMANTAN SELATAN	27.65	TINGGI
176	KEPULAUAN SULA	MALUKU UTARA	27.65	TINGGI
177	GIANJAR	BALI	27.46	TINGGI
178	SINTANG	KALIMANTAN BARAT	27.14	TINGGI
179	AGAM	SUMATERA BARAT	27.01	TINGGI
180	OGAN KOMERING ULU SELATAN	SUMATERA SELATAN	27.01	TINGGI
181	KOTAWARINGIN BARAT	KALIMANTAN TENGAH	27.01	TINGGI
182	TANAH BUMBU	KALIMANTAN SELATAN	27.01	TINGGI
183	KOLAKA	SULAWESI TENGGARA	27.01	TINGGI
184	MANOKWARI	PAPUA BARAT	26.73	TINGGI
185	KOTA SUNGAI PENUH	JAMBI	26.44	TINGGI
186	KOTA TARAKAN	KALIMANTAN UTARA	26.42	TINGGI
187	KOTA PEKALONGAN	JAWA TENGAH	26.42	TINGGI
188	TANJUNGPINRANG BARAT	JAMBI	26.39	TINGGI
189	LOMBOK TENGAH	NUSA TENGGARA BARAT	26.39	TINGGI
190	BURU	MALUKU	26.39	TINGGI
191	KOTA MADIUN	JAWA TIMUR	26.06	TINGGI
192	KOTA SURABAYA	JAWA TIMUR	25.81	TINGGI
193	SIK	RIAU	25.81	TINGGI

Source: IRBI Year 2021

The Surabaya City Fire and Rescue Service recorded that there were 549 fire incidents that occurred in the City of Surabaya during the period from January to September 2022. Of these, 388 were incidents of fires on open land or non-buildings. Data from the Surabaya City Fire Department (2011) recorded that 56.71% of the Fire Management Areas (*MWK*) had a response time of less than 15 minutes. The high percentage of *MWK* has the potential to cause high material losses and fatalities.

The magnitude of the potential or risk of a fire disaster that has been described is of course a special concern for the City of Surabaya with the highest population density and vulnerability to fires. Various efforts can be made in the context of implementing disaster (fire) mitigation, including preparedness in dealing with fire disasters. The *Undang-Undang Nomor 24 Tahun 2007* regarding Disaster Management explains that preparedness is a series of activities carried out to anticipate disasters through organizing and through appropriate and efficient steps.

The Surabaya City Government is making efforts to minimize losses suffered by fire victims in the local area. This effort can be seen from the program provided by the Regional Disaster Management Agency for the City of Surabaya in carrying out disaster mitigation in each region. Communities receive education about the efforts made when a fire disaster occurs. Thus the program can be a means of effectiveness in fire disaster management efforts.

The Surabaya City Regional Disaster Management Agency has a disaster mitigation program that is carried out for public education. This disaster mitigation training can be in the form of earthquake, fire and other disaster mitigation. This disaster mitigation is carried out 5-10 times a month with different target communities. As in school children. Employees in an office, civil society as well as families of patients and hospital employees.

In the research Analysis of the Effectiveness of Fire Disaster Mitigation in the City of Surakarta, the results show that the level of fire disaster mitigation in Surakarta is less effective because, Equipment on fire extinguishers, Disaster

response time, Map of distribution of protection and Early warning are still minimal (Fauzi et al., 2021). While the research Effectiveness of the Disaster Resilient Village Program in Mitigating Fire Disasters in Bojonegoro Regency, East Java Province results that there are limited human resources, remote village accessibility, budgetary limitations, local community culture that considers that a disaster is normal and can not be avoided (Nanda, 2022).

A policy can be said to be effective if the goals and objectives of the policy are in accordance with the provisions of the public policy (Dina Siti Astuti., Dian Purwanti., 2022) . In the study Effectiveness of disaster mitigation education on earthquake and tsunami disaster preparedness in patient families in hospitals, the results showed that fire disaster mitigation education was considered effective in earthquake and tsunami disaster preparedness in patient families in hospitals, because it can educating hospital visitors, especially the patient's family (Husnah et al., 2019). While the research Effectiveness of the Implementation of the Role of the Olo Village Disaster Preparedness Group in Mitigation Efforts for the Earthquake and Tsunami Disaster in the Padang Coast Area shows the result that Mitigation of the earthquake and tsunami fire disaster in the Padang Beach Area has not been effective, due to a lack of education and training received, Lack of budget for the training, Inadequate facilities and infrastructure, Lack of socialization (Syahyanti & Frinaldi, 2020).

Another study entitled Effectiveness of the Regional Disaster Management Agency (*BPBD*) in Earthquake Disaster Mitigation in Majene Regency shows the results of the study that the effectiveness of the Regional Disaster Management Agency (*BPBD*) in Earthquake Disaster Mitigation can be said to be effective. This is because the Regional Disaster Management Agency for Majene Regency has carried out mitigation every year with good results and fulfilled the indicators used by researchers (Utami, 2022).

The Surabaya City *BPBD* is actively providing outreach by distributing pamphlets on the official Instagram of the Surabaya City Regional Disaster Management Agency to the public. Of course, in this way, not only the people of Surabaya City will receive education, but Instagram users will also be educated. The following is an example of a pamphlet distributed by *BPBD* Surabaya City, not only providing outreach on fire disaster mitigation training, the Surabaya City Regional Disaster Management Agency also provides education on how to prevent fires from occurring, for example it is prohibited to burn rubbish in places where it can easily spread in all directions. With various efforts made in socializing fire disaster mitigation, either directly or indirectly will have a significant impact on community understanding regarding fire disaster mitigation or not the resulting impact. From the background of the problems described above, it gives impetus for the writer to analyze the fire disaster mitigation provided to the people of Surabaya City in depth. The author focuses on research on Effectiveness of Fire Disaster Mitigation Training at the Surabaya City Regional Disaster Management Agency.

## **B. LITERATURE REVIEW**

The definition of effectiveness has been put forward by many experts, including that "Effectiveness shows the achievement of the goals/targets that have been set (Komariah & Cepi Triatna, 2005) . "Effectiveness means the completion of work on time" (Siagian, 1995) . This shows that the implementation of a job is considered good or not if it can answer the question when the work can be completed.

The opinion above is in line with the opinions of other experts who define effectiveness as the compatibility between the people carrying out the tasks and the intended targets, how an organization manages to obtain and utilize resources in an effort to realize operational goals. (Mulyasa, 2003).

According to Sutrisno, 2010 the success of an effectiveness also has its own indicators which consist of the following:

### **1. Production**

The production of goods or services describes the organization's ability to produce goods or services in accordance with environmental demands (Fierda Nurany. et al., 2022). These production measures will include profits, sales, market reach, customers served and so on.

### **2. Efficiency**

Efficiency is defined as a comparison of the ratio between output and input (Fierda Nurany et al., 2021). Efficiency measures involve the level of profit, capital or assets, unit costs, depreciation, depreciation and so on.

### **3. Satisfaction**

Satisfaction is an attitude orientation to be able to show how far the organization can meet the needs of its members so that they feel satisfaction while working.

### **4. Adaptation**

Adaptability is to what extent the organization is able to translate existing internal and external changes, then the organization concerned will respond.

### **5. Development**

Development is a phase of long-term survival. For this reason, the organization must be able to expand its capabilities, so that it can develop properly and at the same time be able to have a survival phase.

From a number of definitions of measuring the level of effectiveness that have been stated above, it is necessary for the researcher to emphasize that in this research plan the effectiveness measurement theory is used as proposed by Sutrisno with five indicators. Using this theory is expected to measure the level of effectiveness in fire disaster mitigation training at the Surabaya City Regional Disaster Management Agency.

## **C. RESEARCH METHODS**

The method used in this research is a qualitative research method. Qualitative research method is research that deals with narrative data. Interviews are used as a data collection technique if the researcher wants to conduct a preliminary study to find problems that must be researched, and also if the researcher wants to know things from respondents in more depth and the number

of respondents is small. The informants in this research were *BMKG* Surabaya City Preparation and Preparedness Staff and communities receiving disaster mitigation training. While secondary data obtained through intermediary media or indirectly such as documentation.

## **D. DISCUSSION**

### **a. The effectiveness of fire disaster mitigation training**

The effectiveness of fire disaster mitigation training is measured using the theory from Sutrisno with the following five indicators:

#### **Production Indicator**

Production can be interpreted as how staffs produce something that is produced through fire disaster mitigation training. Based on the results of interviews with the three staff of the Regional Disaster Management Agency for the City of Surabaya, it can be concluded that the results of the work were produced by forming an emergency response team in every place where mitigation training had been carried out. The emergency response team has an important role in the community in dealing with emergency situations and situations that require a quick response. In addition, the results of the work that can be seen are increasing public awareness so that there are many requests for disaster mitigation training from outside the scheduled activities.

Production can be interpreted as how staffs produce something that is produced through fire disaster mitigation training. Based on the results of interviews with the staff of the Regional Disaster Management Agency for the City of Surabaya, the results of the work were produced by forming an emergency response team in every location where mitigation training had been carried out. As the interview excerpt as follows:

"Every place where we have conducted fire disaster mitigation training has formed an emergency response team, where the team is formed in schools, health centres, sub-districts and private agencies"

In addition, the results of the work that can be seen are increasing public awareness so that there are many requests for disaster mitigation training from outside the scheduled activities.

#### **Efficiency Indicator**

The efficiency of disaster mitigation training is that the duration of the training is adjusted to the scale of the participants attending. Based on excerpts from interviews regarding the efficiency of fire disaster mitigation training, namely:

"It depends on the type of training itself, if all are involved it can take two days, one day the material is filled with practice. Small training only takes up to two to four hours"

Effectiveness does not only talk about output problems, but from starting the process to achieving the goals that have been discussed in it (Halim, Aam Ammar., 2022). It can be concluded that this fire disaster mitigation training is held with a large scale of participants, so the training will be held for up to two days. The first day will be given education in the form of theory and material; the second day will be filled with field practice. If the training is attended by

participants on a small scale, the training will be held with duration of three to four hours of lessons. Besides being measured by the duration of time given, efficiency can also be seen from the benefits generated from the fire disaster mitigation training itself.

#### **Satisfaction Indicator**

Based on the interviews that were conducted, *BPBD* Surabaya City staff said the same thing, so the researchers concluded that during the training, the community was satisfied with the performance that had been carried out by the Surabaya City Regional Disaster Management Agency. This is based on interview excerpts from *BPBD* Surabaya City staff as follows:

"Community satisfaction with our fire disaster mitigation training has reached ninety percent, so it can be said that this community has received well regarding the training we have conducted"

By conducting the survey, the Regional Disaster Management Agency for the City of Surabaya knows that the needs and desires of the community are in accordance with what has been taught. With the survey results having ninety percent results, the community is satisfied with the fire disaster mitigation training.

#### **Adaptation Indicator**

After participating in the fire disaster mitigation training that has been organized by the Surabaya City Regional Disaster Management Agency, the community will have new knowledge in dealing with fire disasters. In this case the community must be able to adapt to the knowledge that has been given in the training. The form of adaptation that can be done is by being able to implement this knowledge in everyday life.

"I personally am able to implement it, considering that what was explained in the training earlier was very clear and in line with the practical exercises carried out jointly between the trainees and their trainers"

Based on excerpts from interviews with the community receiving fire disaster mitigation training, it can be concluded that the community is capable of implementing what has been explained by *BPBD Kota Surabaya*. With the basis of providing clear material or theory, it is easy for the community to understand how to deal with fire disasters.

#### **Development Indicator**

The Surabaya City Disaster Management Agency develops or improves employee competence through special routine training activities to improve *skills* and competence. The training will be held either independently or in collaboration with other agencies. This is in accordance with an excerpt from an interview with *BPBD* Surabaya City staff as follows:

"By holding a program to increase the capacity of staff and also troops, we routinely hold this program so that we can increase the competence of our staff for better quality training for the community"

## **b. Barriers and Supporting Factors for Fire Disaster Mitigation Training Facility and Infrastructure Factors**

The Surabaya City Regional Disaster Management Agency has adequate facilities and infrastructure to conduct fire disaster mitigation training on a small scale. To carry out fire disaster management on a large scale, *BPBD* will cooperate with the Fire Department. This is in accordance with excerpts from interviews conducted with Surabaya City *BPBD* staff as follows:

"In our place, we have more or less sufficient equipment to extinguish it on a small scale, for example, a portable fire extinguisher in the form of a fire extinguisher that we can use to extinguish the initial fire before the fire grows bigger, if we use equipment that is useful in extinguishing fires the bigger one is in the Fire fighters"

With the cooperation between the two agencies, the training provided can provide an understanding to the community as a whole, both small-scale and large-scale countermeasures.

### **Employee Competency Factor**

Employee competency factors are appropriate in providing education to the people of Surabaya City. Based on excerpts from interviews obtained with the Surabaya City *BPBD* staff, it is stated that:

"To improve competence, we conduct routine training including special training on disaster mitigation, knowledge of disaster risk and fire hazard, understanding of fire risks and hazards and evacuation skills. Learn communication skills that are useful for delivering material"

It can be concluded that these competencies will be constantly improved through training and practice in the field. Competency enhancement is carried out to develop the knowledge, skills and abilities of staff or trainers which are a regular program carried out by *BPBD Kota Surabaya*.

### **SOP factors that apply**

Training must be based on existing SOPs. *BPBD Kota Surabaya* will carry out the planning stage by identifying training objectives, educating with relevant materials and then making preparations involving collecting and compiling training materials, case studies and practical guides. Trainers involved are also required to have a basic understanding of disasters, especially fire disasters. This is based on interview excerpts as follows:

"Of course the mitigation training that is being held is in accordance with the applicable SOP, we carry out the planning stage by identifying training objectives, we also provide relevant material then we make preparations involving the collection and preparation of training material including theory, case studies and practical guides, from We also choose materials that are easy for participants to understand. We also vary the teaching methods according to the capacity of the participants who are present, the important part is conducting demonstrations with the participants so that they understand and understand, after the training is finished we follow up



by involving the preparation of a fire disaster mitigation action plan in the workplace or community environment.”

### **Community Participation Factors**

Community participation factors based on interview excerpts are as follows, “The factor of community participation is influenced by awareness of the dangers. People need to have sufficient understanding about the dangers of fire and its impact on their lives and property. This awareness can encourage their participation in fire disaster mitigation training. So with things like that community participation will increase and this training can be effective back in this training”

Community participation is encouraged on the basis of public awareness regarding the importance of the training held (Prasetijowati et al., 2022). The more people are aware; the level of participation will be higher. This can be in the form of participating in discussion or question and answer sessions, paying close attention and not joking. When encountered in the field in fire disaster mitigation training, some people are willing to pay attention, but here are quite a few who are not serious in training sessions.

### **c. Efforts made by BPBD in dealing with Obstacles**

#### **Efforts to Improve HR Competence**

That the effort made is by participating in training conducted by the centre or between other agencies. In addition, the efforts made by participating in competency certification are useful for staff validation that they are qualified to become mentors or trainers for the community and also hold coaching or mentoring programs in providing further guidance.

#### **Collaborative Efforts with Other Agencies**

Collaborative efforts with many parties such as the Fire Service, government, communities or communities, NGOs and the private sector. It is important to create a clear framework, respect each other's roles and responsibilities, and communicate openly and continuously. Effective and sustainable collaboration between these various stakeholders can improve fire disaster mitigation capabilities, reduce risks, and protect the safety and welfare of the community.

#### **Efforts in Training Evaluation**

That this evaluation effort was carried out by conducting a community satisfaction survey which could be used as evaluation material by the Surabaya City BPBD. As well as holding regular evaluations between staff to provide an assessment of the performance of each.

#### **Current Efforts and Future Prospects**

Current efforts to carry out disaster mitigation for the school-age children sector, especially for children who are in junior high school so that the skills and understanding of disaster mitigation can be owned by all age ranges. The future prospects for the Regional Disaster Management Agency for the City of Surabaya are to increase competence through capacity building training with validation in the form of competency certification.

Therefore can be seen from the high level of community awareness, the duration of time adjusted to the scale of the participants present, the satisfaction of

the community which can be seen from the satisfaction survey data, the adaptation of trainers in adjusting to environmental conditions during fire disaster mitigation training and the development carried out to improve effectiveness, namely through employee competency improvement programs or staff. (2) The inhibiting and supporting factors in the effectiveness of this training are the facilities and infrastructure factors, employee competency factors, applicable SOP factors and community participation factors. (3) Efforts made by *BPBD Kota Surabaya* are by carrying out competency certification, coaching and mentoring programs, attending routine training specifically for employees or staff and collaborating with other agencies.

## E. CLOSING

### Conclusion

Based on the results of research that has been done, researchers know that fire disaster mitigation training at *BPBD Surabaya City* is an effective program. Judging from the analysis using Sutrisno's theory which is in line with the program objectives. The inhibiting and supporting factors can be overcome by the efforts made by the *Surabaya City BPBD*. These efforts are through increasing HR competencies, collaborating with other agencies and conducting evaluations.

### Suggestion

1. *BPBD Kota Surabaya* must develop fire disaster mitigation training for participants with vulnerable group categories such as people with disabilities and the material is adapted to the participants attending the training.
2. *BPBD Kota Surabaya* can take advantage of digital innovations such as creating applications that are useful for strengthening and educating fire disaster risk reduction to create resilience for a good future.
3. *Surabaya City BPPBD* can make games that can be used for education about fire disasters for early childhood (5-8 years).

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