

## **Verification of the Effectiveness of a Practical Approach to Realizing a Cooperative Interpersonal Relationship for Regional Fire Risk Reduction**

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### **ABSTRACT**

Generally, to improve regional safety against fire, indispensable strategies are not only the reinforcement of the governmental ability, but also the strengthening of the cooperative relationship between government and non-government, which means volunteers, residents, and so forth. Needless to say, effective strategy should be varied depending on the actual situation in the subject area. Bangkok, our study area, is no exception. It was reported that the fundamental problems to first be resolved in Bangkok were not only a shortage of fire stations, but also an uncooperative relationship between governmental and voluntary firefighting. It has been difficult to solve these problems all at once because of deep-rooted chronic problems. In the previous study, although a certain strategy that ought to be useful for realizing a cooperative interpersonal relationship was proposed, the validity of the proposal has not yet been ascertained. Accordingly, in this paper, we would like to put an approach based on this strategy into practice in light of the facts, and to verify the effect of this implementation. In fact, we investigated quite carefully a number of negotiations, meetings, and questionnaire surveys. Finally, it is considered possible to establish a cooperative interpersonal relationship between both parties using the above strategy.

**Keyword:** firefighting, fire volunteer, cooperative relations, workshop, Bangkok

### **1. INTRODUCTION**

Generally, in order to enhance regional safety in the face of disasters and accidents, essential strategies are not only the reinforcement of governmental ability, but also the strengthening of the cooperative rela-

tionship between government and non-government, meaning volunteers, residents, and so forth. Needless to say, the effective strategy should be varied in accordance with the actual situation in the subject area, because there is no guarantee that certain strategies or countermeasures based on the common-sense values

of one subject area will be of universal application to all other regions. Consequently, a process to clarify the fundamental problems in the subject area is essential.

Bangkok, our study area, is no exception. As Bangkok has urbanized rapidly, it is generally said that improvement of regional firefighting ability is a vital topic today. The most fundamental problem is a fatal delay in governmental firefighting arrival at a fire scene. Consequently, sufficient spraying of water at the early stage of a fire by governmental firefighting cannot be expected at present. Needless to say, a fundamental solution to this problem is to increase the number of fire stations. However, it is impossible to put this solution into practice at once, because it is not easy to raise funds and building lots for so many new fire stations in a short period. As a result, some residents have turned to defending themselves, becoming voluntary firefighters, because it is difficult for residents to trust governmental firefighting. It is true that these voluntary firefighters have the advantage of speed. On the other hand, it is also true that sometimes, some voluntary firefighters do not contribute to the extinguishment or rescue at all due to their lack of knowledge, skill, and morals. Moreover, it often happens that the voluntary firefighters obstruct the official firefighters' activities.

This situation of firefighting between the official firefighters and the voluntary firefighters in Bangkok has already been reported in a previous study (Sripramai et al., 2011).<sup>[1]</sup> Moreover, it was also considered that there is no method that does not make use of voluntary firefighters, not only to counteract the fatal delay in governmental firefighters' arrival at a fire scene but also to increase the amount of potential spraying water. In fact, in some basic laws in Thailand, there are descriptions of the cooperative relationship between official firefighters and voluntary firefighters for not only fire events but also all disasters (Disaster Prevention and Mitigation, 2007). However, it is true that there is no such cooperative relationship at all in real life. In the previous study, on the basis of a feasibility investigation into the cooperative interpersonal relationship, it was concluded that although it was difficult to effect such a relationship immediately, a glimmer of hope can be seen. Furthermore, it was suggested that holding a consultation with each other for mutual understanding was quite important as a

strategy that should be considered in a practical approach. However, it is also true that the validity of the above proposal has not yet been confirmed. Besides this, whether such a proposal is fully practicable or not has not even been ascertained. Accordingly, in this paper, we would like to put the approach based on the above proposal into practice in light of the facts, and to verify the effect of this practical approach in the establishment of a cooperative relationship between voluntary firefighters and governmental firefighters in Bangkok.

If we direct our attention to the recent Japanese situation from the above point of view, we can observe a highly developed firefighting system through which a fire can be immediately extinguished, except for a large number of simultaneous fires in a huge earthquake. It is considered that there is the effect of a smooth cooperative relationship between governmental and non-governmental firefighting. Generally, what is important in the case of not only Japan but also some developing countries is that voluntary firefighting plays a part in official firefighting on a legal basis.

Generally, it is unusual for most developing countries to have such a highly developed firefighting system. For example, AUDMP and ADPC reported a situation in Laos (AUDMP, ADPC, 2003). This is also an interesting report on community-based fire risk assessment under the condition where there is not even any organized voluntary firefighting at all.

It seems that Bangkok, our subject area, is an intermediate case between that of Japan and that of Laos concerning the firefighting system, because there is both governmental firefighting and organized voluntary firefighting in Bangkok. However, voluntary firefighting groups in Bangkok are not positioned as part of the official firefighting on a legal basis. In the past, there were indeed some researches (Khunt-eetao, 2007) on volunteer activities in Thailand, but it is difficult to find other studies on solutions to improve regional firefighting ability, especially studies focusing on the relationship between official and voluntary firefighting.

## 2. FRAMEWORK OF THIS APPROACH

### 2.1 Outline of this framework

In this chapter, we will discuss the framework of this

practical approach. The aim of this approach is for both parties to establish a cooperative interpersonal relationship for regional fire risk reduction in Bangkok. Needless to say, if both parties had already had mutual understanding about the importance of a cooperative interpersonal relationship from the beginning, all that would have been needed would be to set up a joint meeting for them to discuss concrete and immediate solutions. However, as we reported in the previous paper (Sripramai et al., 2011), far from being in this desirable situation, it was clear that both parties disliked each other.

Generally, in order to change this hostile relationship to a cooperative one, discussion based on transferring subordinate immediate frames to a superordinate common frame plays an important role (Azuma, 2009). In this study, the phrase “superordinate common frame” implies that both parties think about regional safety and saving people’s lives from fire through unanimous cooperation. Therefore, we held up the following point as a fundamental, essential matter that should be achieved through our practical approach.

*[Point 1] Both parties should recognize that the other’s most fundamental public spirit is identical to their own.*

However, it is clear that resolving the above issue alone will not accomplish the establishment of a cooperative interpersonal relationship for regional fire risk reduction. Namely, nobody ought to have any motivation to establish a cooperative relationship without recognizing its effects. Therefore, it is considered that the following point must be achieved simultaneously.

*[Point 2] Both parties should recognize that collaboration is effective in achieving the above unity of public spirit.*

However, there are many obstructions and concrete problems in the establishment of a cooperative relationship. Namely, even if the above two points were wholly achieved, it would still be difficult to establish a cooperative relationship without recognition of its feasibility. Therefore, the following points should be achieved simultaneously.

*[Point 3] Both parties should recognize that it is possible to achieve collaboration.*

If the three conditions above had been satisfied completely, it could then have been an easy matter to establish a cooperative relation between them. At this point, taking a look at the real world, we notice the difficulty of having a place for discussion with both parties in order to achieve the above three points. Therefore, we are obliged to say that it is still difficult to accomplish the establishment of a cooperative relationship without recognizing the following point.

*[Point 4] Both parties should recognize that a place for discussion is essential in order to put the above three points into practice.*

In this study, in order to establish a cooperative relationship by accomplishing the above four points, we set several procedural steps. As shown in Fig. 1, the research reported in the previous paper (Sripramai et al., 2011) is positioned as a first step to grasp the initial stance for the above four points. Afterward, to enhance their motivation for having a joint meeting, we proposed a negotiation step, which was further separated into a pre-meeting step before the joint meeting. During this approach, we also set several checkpoints to confirm their actual stance toward the above four points. These checkpoints were conducted as questionnaire surveys indicated as signs [1G], [2G], [3G], [4G], [1V], [2V], [3V], and [4V] in Fig. 1.

Details of the above four steps are explained in the following.

## **2.2 Step 1: Initial stance**

In the previous study (Sripramai et al., 2011), questionnaire surveys were conducted for both the voluntary firefighters and the governmental firefighters in Bang Khae District, Bangkok, Thailand, which was chosen as the case study area. The aim of these surveys was to investigate their initial stances toward collaboration. Therefore, in this study, we would like to interpret these previous surveys as a first step in our practical approach. In other words, the following practical activities in this study should be based on the result of these previous surveys, and should be carried out for the same district as the previous surveys.

In Fig. 1, we use the symbol “questionnaire

survey [1G]” and “[1V]” to represent these previous surveys for convenience of description. Furthermore, we would like to summarize and reproduce here the results and an outline of surveys [1G] and [1V] as Fig. 2 and Table 1. According to these results, the following matters have already been resolved.

Firstly, as the Fig. 2(1) indicates, it was clear that both sides recognized their own advantages and

disadvantages. Namely, the voluntary group has the advantage of being able to arrive at a fire scene earlier than the governmental firefighters, and the governmental firefighters have the advantage of having expert equipment, techniques, and knowledge. As far as the above results are concerned, it seems that both were complementary to each other and that collaboration was fairly efficient.

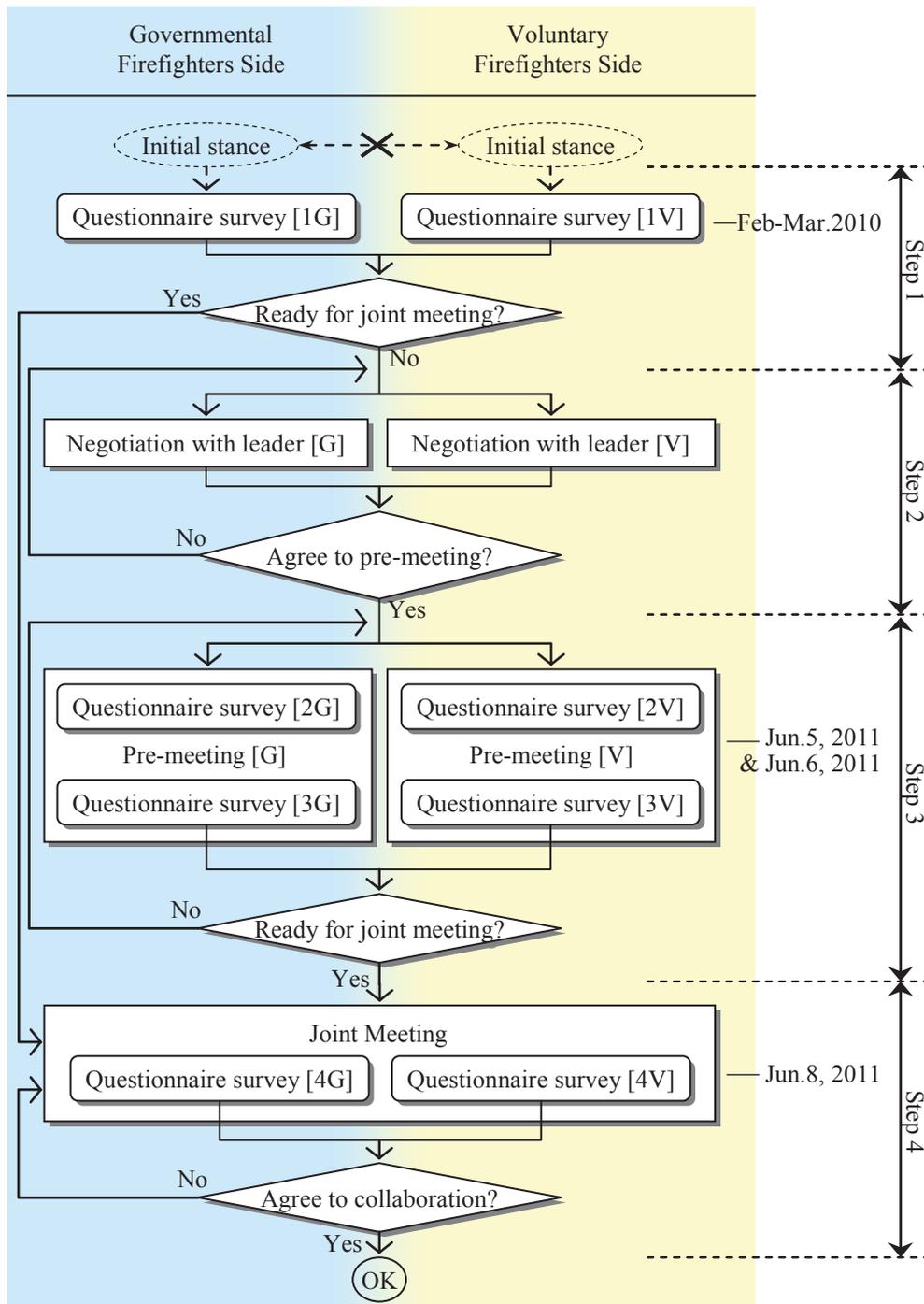


Fig. 1 Framework of this approach

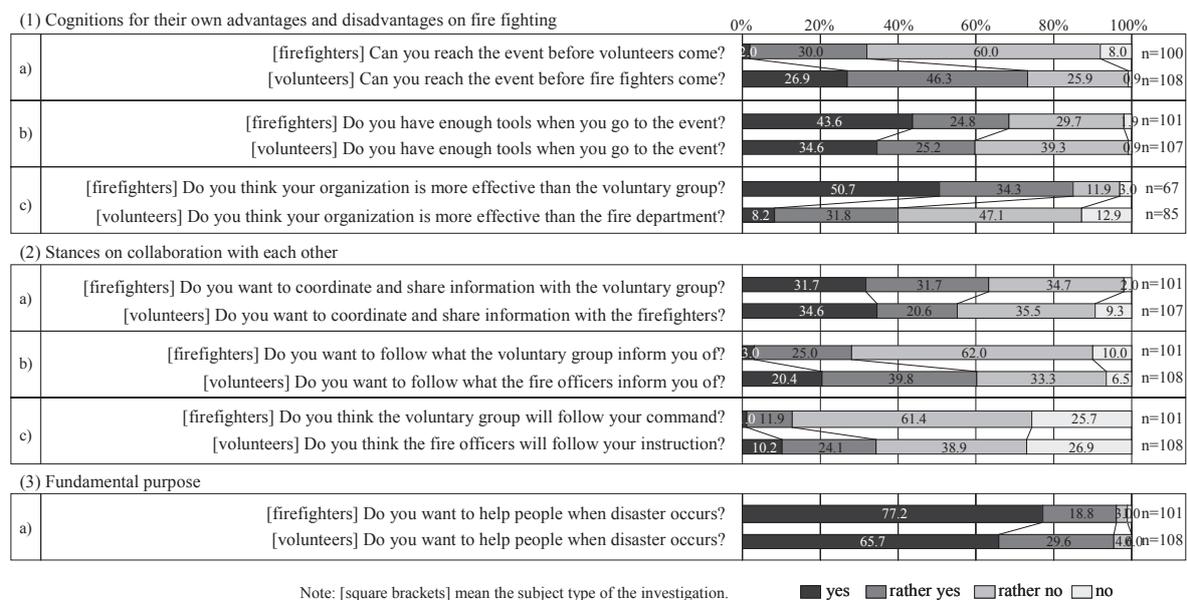


Fig. 2 Summary of the results of previous questionnaire surveys [1G] and [1V]

Table 1 Summary of questionnaire surveys [1G] and [1V]

	Governmental Firefighters [1G]	Voluntary Firefighters [1V]
Date	February-March 2010	
Area	Bangkok (Bang Khae District)	
Distribution	Handing out the questionnaire	
Return	Picking it up later	
Sample	101	108

On the other hand, previous survey results as shown in Fig. 2(2) also made it clear that both parties had a negative stance on collaboration with each other. In fact, it was said that this disagreement has been a deep-rooted chronic problem over all Bangkok for a long time. In this sense, it was concluded that it would be quite difficult to immediately effect a genuinely cooperative relationship between them in a situation of chronic conflict and discord. At that time, if we had promptly called both parties together for discussion about collaboration, the meeting would have been a complete failure. In fact, no one has succeeded in settling this issue in Bangkok.

In contrast, it was also confirmed from the result of the surveys shown in Fig. 2(3) that both parties had a common public spirit of “saving as many lives as possible.” In this sense, it was also concluded that there was a glimmer of hope and a foundation for cooperative relations between them. However, this

result did not necessarily show that there was already a mutual understanding regarding firefighting. On the contrary, it would be better for us to understand that both parties did not know that the other party’s thinking on this issue was the same as their own thinking, not only because there was almost no contact with each other before, but also because they disliked each other.

As a whole, the conclusions of the previous study were that the immediate establishment of a cooperative relationship under chronic conflict and discord was not so easy, and that the key to resolving this matter was mutual understanding, rather than just conveying the will of the governing to the governed.

### 2.3 Step 2: Negotiation with leaders

However, it is also considered that such a joint meeting should be held after careful preparations, and not be set abruptly, because it was clear that neither were ready for a face-to-face discussion at this point. Therefore, it is also considered that we should hold separate pre-meetings for each party in parallel before the joint meeting. However, it also seems that such pre-meetings are still unthinkable from both parties’ points of view, even if the pre-meetings were separately conducted. Accordingly, we started to focus our efforts on negotiations to hold separate pre-meetings.

The persons to contact about this matter were mainly the leaders of both parties. At first, as we

thought, both leaders had a negative stance toward holding such a series of meetings. Therefore, we began to try to create a relationship of mutual trust between the leaders and us. After that, when we began to feel that the leaders had trust in us, we began to talk about the four essential points given above.

Eager negotiations were started in about April 2010 and continued for about one year until a decision was made on holding separate pre-meetings. During this period, the authors tried to maintain telephonic communication with the leaders at least once a week. And the author also once visited the voluntary firefighters' base in Bang Khae District and the Bang Khae Fire Station in August 2010.

Through these enthusiastic negotiations, the leaders' stance toward these meetings finally changed to positive. So, we judged that the minimum requirements for holding the separate pre-meetings were satisfied, but it was also true that there was no guarantee that such a positive change would occur for the ordinary members of both parties.

#### **2.4 Step 3: Separate pre-meetings**

Progressing as described above, we held two separate pre-meetings in parallel. Needless to say, the purpose of these pre-meetings was to prompt both parties to approve the holding of a joint meeting. Therefore, in these pre-meetings, we explained the four essential points given above, not only by reporting the results of previous questionnaire surveys [1G] and [1V], but also by showing the Regional Firefighting Validity Map developed in the previous study in order to show the effect of collaboration on regional fire risk reduction as a simple visualization.

In order to verify the pre-meetings, we conducted surveys using questionnaire forms before and after these pre-meetings. Questionnaire surveys [2G] and [2V], as shown in Fig. 1, were conducted to confirm their a priori cognitions, which were not affected by information provided at the pre-meetings. Furthermore, questionnaire surveys [3G] and [3V] were conducted to confirm their a posteriori recognitions, which ought to be affected by information provided at the pre-meetings.

However, if we make a pessimistic interpretation, one possibility was to assume that these pre-meetings not only influenced their stance but in fact made their stance negative. Another possibility was

that their stance before the pre-meetings had already turned positive. The former possibility will be verified by comparison with the results of [2G] and [3G], and with the results of [2V] and [3V]. And the latter possibility will be verified by the results of [2G] and [2V].

In particular, if the results of [3G] and [3V] made it clear that their a posteriori stance on having contact with each other was not very positive, we then had to judge whether it was still too early to hold a face-to-face discussion as a joint meeting. A full account of this point will be given in Chapter 3.

#### **2.5 Step 4: Joint meeting**

In fact, we ended up by holding a joint meeting. The details of the joint meeting will be given in Chapter 4. At this joint meeting, we explained the four essential points given above by reporting the results of the previous questionnaire surveys [2G], [3G], [2V], and [3V]. After that, we spent a lot of time on discussion.

At the end of the joint meeting, we also conducted surveys [4G] and [4V] using the questionnaire form as a final checkpoint. As we mentioned above, no one has succeeded in holding such a joint meeting and establishing cooperative relations between them in the past. In this sense, the results of [4G] and [4V], which indicated whether their stance turned positive or not, have quite a significant meaning and decide the success or failure of this approach.

### **3. SEPARATE PRE-MEETING**

In this chapter, we will describe the details of two separate pre-meetings. Firstly, in (3.1), we will explain what kinds of information were presented at the pre-meetings. Further, in (3.2), we will give details of the results of the questionnaire survey.

#### **3.1 Contents of the pre-meetings**

As Table 2 shows, pre-meetings were held separately for the governmental firefighters and the voluntary firefighters. But the contents of both were exactly the same.

At the beginning, questionnaire surveys [2G] and [2V] were conducted to grasp the a priori recognitions.

After that, we made a summary report of the results of previous questionnaire surveys [1G] and [1V], focusing on points (2a), (2b), and (2c) as shown

**Table 2** Outline of the pre-meetings

	Governmental Firefighter Side	Voluntary Firefighter Side
Date	June 6, 2011 / 9:30 a.m.-11:30 a.m.	June 5, 2011 / 9:30 a.m.-11:30 a.m.
Place	Conference room in Bang Khae Fire Station	Bang Khae voluntary fire base
Number of participants*	22	42
Contents	1. Questionnaire survey [2G]	1. Questionnaire survey [2V]
	2. Summary report of previous questionnaire surveys [1G] and [1V] (2a) Both parties recognized their own advantages and disadvantages. And it seems that both were complementary to each other, and that the collaboration was fairly efficient. (2b) Both parties had a fairly negative attitude toward collaboration with each other. (2c) Both parties had a common public spirit of “saving as many lives as possible.”	
	3. Explanation of the effectiveness of collaboration (using the Regional Firefighting Validity Map) (3a) Actual situation of firefighting validity in this area. (3b) The 7 essential problems with collaboration scenarios to improve the actual situation. (3c) The effectiveness of the above collaboration on regional fire risk reduction.	
	4. Others	
	5. Discussion	
	6. Questionnaire survey [3G]	6. Questionnaire survey [3V]
	7. Commemorative photograph	
	8. Lunch	

\*Note: This number means just the respondents of the questionnaire surveys. In fact, there was a bigger audience than these numbers.

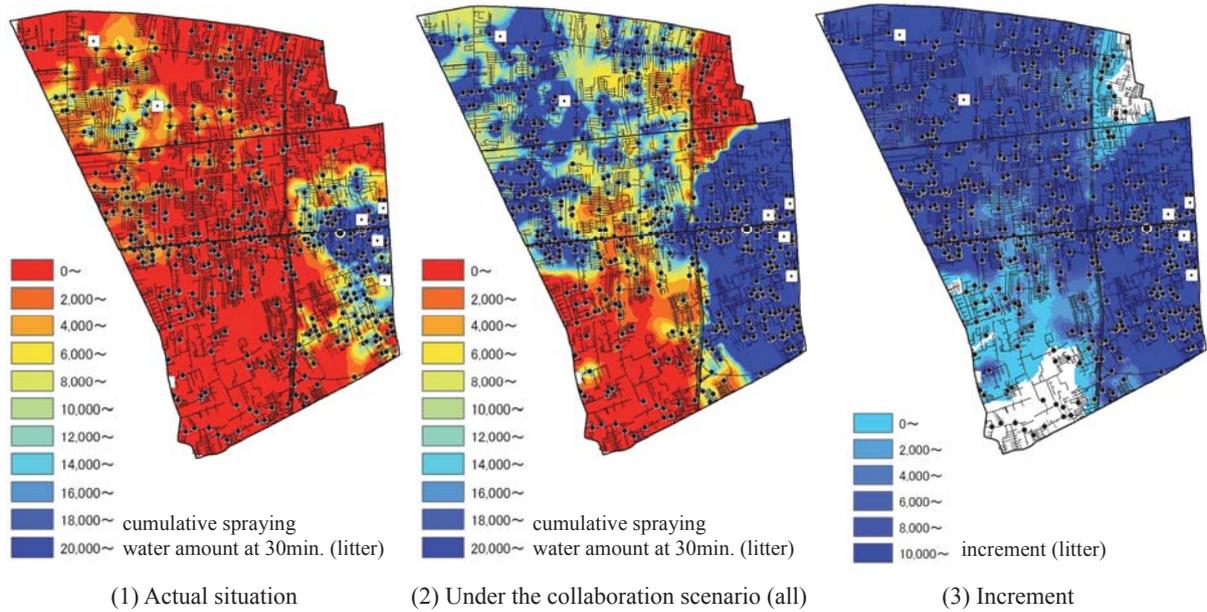
in Table 2, while screening slides. The graphs in these slides were exactly the same as reported in the previous paper. This part may be reworded as providing information on “Point 1” mentioned in the previous chapter.

Moreover, we explained the effectiveness of collaboration between the governmental firefighters and the voluntary firefighters, using the Regional Firefighting Validity Map. In this part, seven essential problems for the improvement of firefighting validity in this area were proposed, as shown in Table 3, with seven collaboration scenarios corresponding to each problem. In addition, the effectiveness of each collaboration scenario was shown as a map as compared with the actual situation. Because we do not have enough space to show every map, we will introduce a typical example, Fig. 3, which indicates the effectiveness under the condition in which all scenarios are executed completely. That is to say, Fig. 3 (1) indicates the amount of cumulative spraying water under actual conditions, and Fig. 3 (2) indicates the amount under the condition where every scenario is executed completely. This amount is defined as the total amount of

water supplied by both governmental firefighting and voluntary firefighting at given time  $TV$ . In Fig. 3,  $TV$  is 30 minutes. Additionally, Fig. 3(3) indicates the difference between Fig. 3(1) and Fig. 3(2). In Fig. 3, it can be easily seen that collaboration produces a remarkable improvement in [cumulative spraying water amount]. For further details of the method of mapping, see the previous paper (Sripramai et al., 2011). At any rate, this part may be reworded as providing information on “Point 2” mentioned in the previous chapter.

Next, we presented some other topics that we expected the participants to have interest in, for example, the fire volunteer system in Japan, recent disasters, and so forth.

Some of the questions and answers in the discussion period were not so negative, but were permeated with their hopes and anxieties. What should be emphasized is that all their comments in the discussion period were based on a good understanding of the above information regarding “Point 1” and “Point 2.” After that, to grasp the a priori recognitions, we also conducted questionnaire surveys [3G] and [3V].



**Fig. 3** An example of the Regional Firefighting Validity Map to show the effectiveness of collaboration

In the end, to cultivate mutual friendship, we took a commemorative photograph and talked about various topics over lunch.

### 3.2 Changes of their cognition

Figure 4 shows the results of five questions on these surveys. In this figure, the results of the governmental side are shown on the left-hand side of the row, and the results of the volunteer side are on the right-hand side of the row. In this figure, the results of surveys [2G] and [2V] are indicated as [before], and the results of surveys [3G] and [3V] are indicated as [after]. These graphs are arranged vertically in order to make it easier to understand the change of each question before and after.

According to Fig. 4(1), it is clear that both the governmental firefighters and the voluntary firefighters thought, not only on [after] but also [before], that the most fundamental public spirit of “saving life” was the same as each other’s. It is likely that one of the reasons that their cognitions [before], corresponding to “Point 1” mentioned in the previous chapter, had already become desirable was that the leaders who had already recognized this before through our negotiations had broadcasted information to other members.

Continuously, according to Fig. 4(2), it can be

said that a great number of respondents of both parties thought before that collaboration was effective, but this number increased obviously after the pre-meetings. It may be said, at least, that this increase resulted from providing information on “Point 2” mentioned in the previous chapter.

In contrast, although such obvious changes cannot be confirmed more clearly from their impressions in Fig. 4(3), their impressions were not so negative.

On the other hand, according to Fig. 4(4), it can be seen that their cognition about the possibility of establishing a cooperative relationship was rather low [before\*] and [before]. However, it is quite clear that their cognition changed to one of great hope after these pre-meetings. We can say that the cause of this great change was these pre-meetings with statistically significant difference, and that it was here that we succeeded in providing information on “Point 3” mentioned in the previous chapter.

This upward tendency in their positive opinions can also be confirmed in Fig. 4(5). Namely, both parties began to want contact with the other party more strongly. According to these results, we judged that it was here that we succeeded in providing information on “Point 4” mentioned in the previous chapter, and that both parties had changed and were now ready for a joint meeting as a next step.

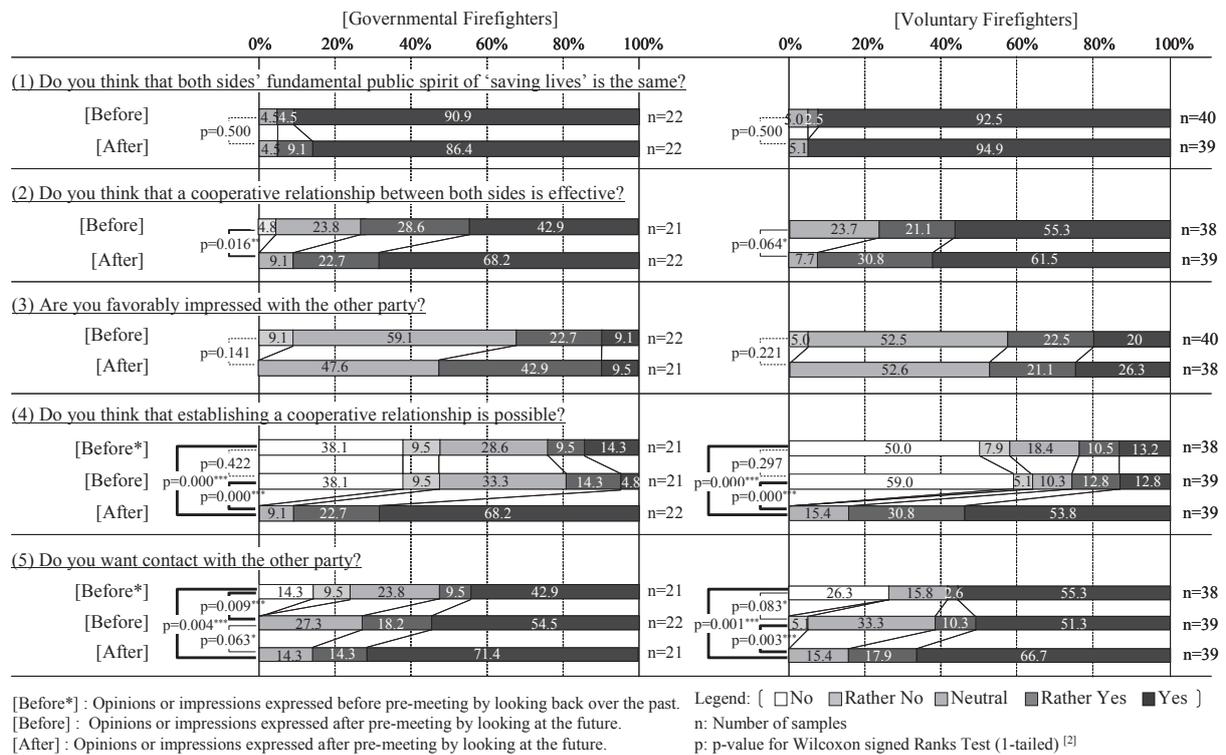


Fig. 4 Results of the surveys before and after the pre-meetings

#### 4. JOINT MEETING

At the beginning of this approach, we were concerned that both the governmental firefighters and the voluntary firefighters would enter an altercation if they met together abruptly in such a joint meeting. However, it was confirmed without doubt by the surveys on the pre-meetings that both were ready for a joint meeting. Consequently, we finally took the plunge and held a joint meeting. The purpose of this joint meeting was to verify their superordinate perspectives for collaboration, and to discuss how to solve subordinate problems.

##### 4.1 Contents of the joint meetings

As shown in Table 4, both the governmental firefighters in Bang Khae Fire Station and the voluntary firefighters in Bang Khae District met together openly for the first time in a conference room. Key persons of both parties also took part in this meeting. The key person of the voluntary group was the Bang Khae District former counselor, and the key person of the governmental firefighters was the chief of Bang Khae Fire Station. We asked them to sit side by side in front of the other members, with the intention of

giving the impression to the other members that both parties were on an equal footing in this meeting. The key persons were not overbearing, but always tried to promote constructive discussions. At the beginning, in order to break the ice, we suggested that all the members introduce themselves.

After that, we made a summary report of the results of previous questionnaire surveys [2G], [2V], [3G], and [3V], while screening slides. The shapes of the graphs in these slides were exactly the same as Fig. 4. The role of this part was not only a simple summary report, but to notify that each party's superordinate perspectives for collaboration were exactly the same in terms of the above essential points from 1 to 4. In brief, we tried to make them notice that a prejudice against the other party without mutual understanding, like in the past, was quite shortsighted and unproductive for regional fire risk reduction. Furthermore, we also emphasized that it is quite difficult to find any reasons why both parties do not try to establish a cooperative relationship, looking at these survey results as a third party. At this time, if such a summary had appeared an exaggeration to them, they would then have complained about it. However, in practice, most members do agree with it.

**Table 3** The 7 essential problems and collaboration scenario introduced at the pre-meetings

No.	Problem	Example of the collaboration scenario
1	Time loss by misunderstanding the emergency telephone number <i>— In 2003, it was changed from “191” to “199.” But more than a few people do not know it.</i>	Both the governmental firefighters and the voluntary firefighters can receive an emergency call immediately at the same time.
2	Serious traffic congestion <i>— It causes a delay of fire engine arrival.</i>	(It is quite difficult to resolve immediately.)
3	Obstruction of a fire engine’s movement <i>— a) Illegal parking on local streets — b) Crowd of volunteers’ cars in front of a fire site</i>	Almost all cars make way for the official fire engines.
4	Impossibility of putting fire hydrants to use <i>— a) Breakdown of hydrants — b) Shops or street stalls often hide hydrants. — c) Voluntary firefighters who come earlier than official firefighters often keep the hydrant to themselves. So, the official firefighters cannot connect to it.</i>	Both the governmental firefighters and the voluntary firefighters maintain them jointly at ordinary times, and the official firefighters take precedence.
5	Time loss for gathering information at the site of fire <i>— After arriving at a site of fire, official firefighters have to spend time researching conditions and gathering information.</i>	The voluntary firefighters who arrive earlier report the state of fire to the governmental firefighters who arrive later.
6	Lack of human resources for watching out for theft of firefighting equipment <i>— For this reason, a loss of 2 or 3 human resources from the official firefighting team causes a decline in the efficiency of official firefighting.</i>	The voluntary firefighters perform backward support of the governmental firefighters.
7	Lack of volunteers’ equipment <i>— The volunteers’ equipment for extinguishing is hardly sufficient. In particular, when there are no hydrants available, then most volunteers have nothing to do with the fire extinguishing.</i>	The number of fire engines with a water tank is to be increased in each voluntary base.

Subsequently, we represented the seven essential problems and the collaboration scenarios to improve the actual situation as mentioned in the previous chapter and Table 3. The role of this part was to suggest some subordinate immediate solutions to realize a superordinate perspective for collaboration. We started the discussion part by this re-presentation.

Finally, we also conducted questionnaire survey ([4G] and [4V]) as a final checkpoint. In the last place, to cultivate mutual friendship between them, we took a commemorative photograph, and talked about various topics over lunch.

#### 4.2 Their own proposals

At this joint meeting, there were many discussions about the above seven essential problems and the collaboration scenarios shown in Table 3. These discussions were mostly positive and constructive. Moreover, both parties came to an agreement regarding the above collaboration scenarios. What must be noted is that both parties proposed many original concrete ideas as follows beyond the collaboration scenarios that the authors presented as a starting point for discussion.

**Table 4** Outline of the joint meeting

	Governmental Firefighter Side	Voluntary Firefighter Side
Date	June 8, 2011 / 9:30 a.m.-11:30 a.m.	
Place	Conference room in Bang Khae Fire Station	
Number of participants*	23	15
Contents	1. Self-introduction	
	2. Summary report of previous questionnaire surveys [2G], [2V], [3G], and [3V]	
	3. Re-presentation the 7 essential problems with the collaboration scenarios to improve the actual situation	
	4. Discussion	
	5. Questionnaire survey [4G]	4. Questionnaire survey [4V]
	6. Commemorative photograph	
	7. Lunch	

\*Note: This number means just the respondents of the questionnaire surveys. In fact, there was a larger audience than these numbers.

**4.2.1 Time loss by misunderstanding the emergency telephone number**

In the past, “191” was the emergency telephone number for both the police and in the case of fire. However, since November 1, 2003, this emergency telephone number was separated into “191 (police)” and “199 (fire station).” Nonetheless, there is still a tendency for many people to dial “191” when a fire accident occurs because of insufficient announcement of this change. Both parties understood that a full announcement was the duty of governmental fire-fighting. Nonetheless, the members of this voluntary firefighting group proposed that the voluntary firefighters should also play a large part in disseminating this fact, on the grounds that the voluntary firefighters were closer to the communities than the governmental firefighters.

**4.2.2 Serious traffic congestion**

Generally, in Bangkok, serious traffic congestion leads to fatal delay of the governmental firefighting arrival at the fire scene. At this point, it is true that the voluntary group has the advantage of not only being able to arrive at the fire scene earlier than the governmental firefighters but also being well versed in local road networks. Before this meeting, we thought that it would be difficult to find any measures. However, both parties worked out an original measure as follows. If it were possible for both parties to have a joint radio communication channel, the fire volunteers could then suggest the route through which the gov-

ernmental fire engine can go smoothly.

**4.2.3 Obstruction of governmental fire engines’ movement and activities**

At this meeting, both came to an agreement that the volunteers should not obstruct the governmental fire engines’ movement and activities. Besides this, the fire volunteers proposed that the volunteers who could arrive earlier should prepare the own fire hose to be ready when the official water supply truck reaches the fire scene.

**4.2.4 Time loss for gathering information at the site of fire**

They came to an agreement that if it were possible for both parties to have a joint radio communication channel as mentioned above, then both could relay messages to each other. For example, the fire volunteer who arrives at the fire scene first can describe the situation to the governmental fire officers who can then suggest how to deal with the situation while they are on the way.

**4.2.5 Lack of human resources to watch out for the theft of firefighting equipment**

It was true that governmental firefighting equipment has often been stolen by somebody pretending to be a general public member or to be even a voluntary firefighter. For watching out for such theft, lack of human resources from the governmental firefighting team was unavoidable in the past. At this meeting,

both came to an agreement that some of the voluntary firefighters should play a part in watching out, and governmental firefighter should concentrate on extinguishment activities.

Additionally, the leader of the voluntary group suggested the inspection of newcomers to avoid the wrongful recruitment of unsuitable people. Furthermore, the voluntary firefighters themselves suggested that there should be a volunteer’s ID card for every volunteer participating in fire-extinguishing procedures. Such concrete proposals seemed to be valuable in cultivating mutual trust.

**4.2.6 Lack of volunteers’ equipment**

In fact, it is difficult to increase a number of fire engines with a water tank in each voluntary base all at once. Therefore, both parties came to an agreement that both parties would try to perform their duties in cooperation with each other. In particular, they also reached the agreement that the firefighters would allow the volunteers to use some of the official fire equipment at the fire site within a relationship of mutual trust. Incidentally, when the fire volunteers need to borrow equipment from the governmental fire officers, they can use the above ID card as a guarantee for the loss of equipment. However, they also suggested that there would be no need to use these ID cards on condition that they have full trust in each other in the long run.

**4.3 Their perspective for collaboration**

At the end of the joint meeting, we also conducted questionnaire survey ([4G] and [4V]) as a final checkpoint. It was quite a simple survey that contains only two questions as shown in Fig. 5. Moreover, most of this survey was devoted to an open-ended question.

According to Fig. 5(1), it is clear that both parties had a fundamental agreement on establishing a cooperative relationship with each other. Further-

more, what Fig. 5(2) makes clear is that both parties also had a strong will to solve some subordinate and immediate problems. It can be considered that this strong will is the result of various factors, such as the positive and constructive discussions mentioned in the previous section. From this viewpoint, we may conclude that the intended purpose of this approach at the beginning was satisfied.

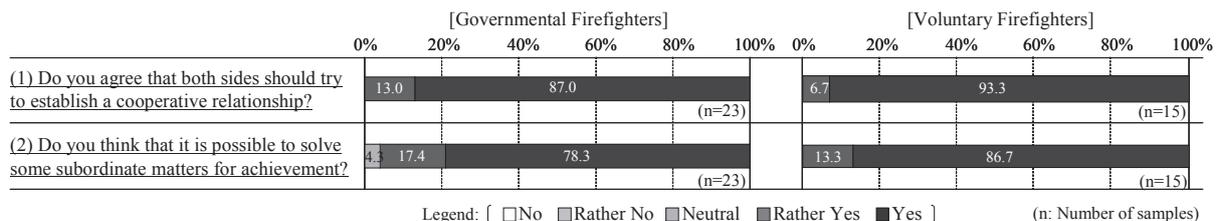
The following are some summarizations of typical replies to the open-ended question. The following replies are sure to authenticate the above conclusion.

The most important point is that many participants thought highly of these meetings. According to these replies, before this series of meetings, hardly any of the participants understood that both parties had the same fundamental stance on helping people. However, through the series of these meetings, both began to listen to the other party’s opinion regarding what they want. Additionally, some participants replied that if these meetings had not been launched, then neither party would have had any chance to gather in unity of purpose in a situation of conflict and discord.

In particular, what needs to be emphasized is that most of them desired to have more meetings and continue the discussion with each other. They also replied that they had never talked and analyzed the problems in their own communities with each other in the past. This may be the reason why continuous meetings are required by both parties.

As a whole, there were a lot of opinions of approbation regarding the several collaboration scenarios and so forth as mentioned in (4.2). Additionally, some of them replied that practical firefighting training with each other was also required.

Only at the very end, to cultivate mutual friendship between them, we took a commemorative photograph and talked about various topics over lunch. After that, this meeting broke up in a very friendly



**Fig. 5** Results of the survey after the joint meeting

atmosphere.

#### 4.4 Continuity for collaboration

Additionally, we should also mention continuity. It has been reported that it often happened that the outcome of a certain practical activity, such as our approach, came to naught just because the prime mover suspended the activity (Katada et al., 2011). On the other hand, after the joint meeting, far from being fruitless, the effect of our practical approach spread in various ways as follows. According to some interviews with both leaders in August 2011, both of them had already started to put the several ideas shown in Table 3 into practice to the extent possible. Above all, both have come to try to build a closer connection with each other, such as close teamwork at a fire site, calling each other by name, and so forth. Furthermore, a fire drill at an elementary school and so forth was executed under collaboration between them. Incidentally, in the past, the number of participants at the above fire drill was usually about five persons from Bang Khae Fire Station while there was no one from the voluntary firefighting groups. On the other hand, almost thirty persons from Bang Khae Fire Station and almost seventy persons from the voluntary firefighting groups participate in the fire drill at present. After such fire drills, many groups of schoolchildren started making field trips to the Bang Khae Fire Station with teachers, and both the governmental fire officers and the voluntary firefighters started to deal positively with such visitors. We heard that this was quite a rare situation not only in Bang Khae District, but also in the whole of Bangkok's history. Because of this, this approach is attracting many people's attention, such as a number of voluntary firefighters and governmental fire officers in the whole of Bangkok, the headman of Bang Khae District, the deputy governor of the Bangkok Metropolitan Administration, and so forth.

## 5. CONCLUSION

It follows from what has been discussed thus far that the intended purpose of this approach has been satisfied. Namely, there is no doubt that this approach has prompted both the governmental firefighters and the voluntary firefighters in this area to establish cooperative relations for regional fire risk reduction. In view

of the details of their history before this approach, such cooperative relations between them had seemed impossible. However, we may say that the strategy, which was devised as essential points from 1 to 4 according to an investigation of actual conditions, was helpful in solving this chronic problem peculiar to this district.

Turning now to the above strategy, far from being limited to the topic of fire risk reduction in this district, it might have wide application. That is to say, if we had concentrated on solving the subordinate immediate problems shortsightedly without their cognitions of both the superordinate purpose and the context connecting the superordinate purpose to the subordinate solutions, then neither party could have approved the subordinate solutions shown in Table 3. In other words, we can compare the past situation to the proverb "cannot see the forest for the trees." Needless to say, in this case, the word "forest" corresponds to the common public spirit of "saving as many lives as possible" as a superordinate purpose, and the word "tree" corresponds to the subordinate immediate problems shown in Table 3. In brief, without unity of fundamental purpose, it is mostly impossible to solve any immediate conflict or discord with the parties concerned. Moreover, what should also be emphasized is that several questionnaire survey reports for both parties played an important role in an understanding of the other party's opinion, and that visualization by the Regional Firefighting Validity Map made it possible for them to understand how effective a certain measure was in the achievement of the united purpose. In fact, all materials shown at the pre-meetings were designed to make it easy for the general public to understand.<sup>[3]</sup> However, even if these materials had been distributed separately without explanation, they would not have been able to reach such a good understanding. At least, in this case, it is considered that it was significant that one coordinator explained the message consistently regarding points 1, 2, 3, and 4 as one package using the above effective tools.

In this sense, we should mention the requirements for researchers or outsiders who try to manage such a project. Firstly, it is considered that a fair attitude toward each party is necessary. Furthermore, endeavor toward the common public spirit is important. Secondly, ability to provide objective knowledge and

information is also required. Finally, the confidence of each party is essential. Fortunately, it can be said that the authors met the above requirements.

A future direction of this study will be to investigate the method or strategy to be expanded widely not only throughout Bangkok and Thailand, but also to certain regions in the world whose official firefighting ability is insufficient. The point of this investigation will be whether the practical approach should be executed in much the same way as the case of Bang Khae District or not. However, if we focus within Bangkok, we expect that it will be simpler. That is to say, it is likely that it is sufficient to introduce only the process of the Bang Khae District as a pilot case study to the persons concerned in the future subject area, because most of these persons in Bangkok already have interest in this matter of Bang Khae District. In this sense, we may say that an investigation of an effective publicity strategy will become to be significant in Bangkok.

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#### NOTE:

[1] Most of the voluntary firefighters tend to think themselves more capable than the official firefighters, and most of the official firefighters also tend to think themselves more capable than the voluntary firefighters. It can be considered that the reason why both parties had been in conflict for a long time was that the above situation continued because of the lack of exchange between them. For more information about the details and background, see the previous study (Sripramai et al., 2011). Incidentally, with the leader's agreement, most residents can join the voluntary group unless they

seem exceptionally shady. Most voluntary group leaders far from being like a feudal lord, and are gaining the members' confidence.

- [2] These statistics are the Wilcoxon signed-rank test (Wilcoxon, 1945). It is a non-parametric statistical hypothesis test. It can be applied to the comparison of a pair of samples whose measurement scale is ordinal.
- [3] For example, only by reading the differences in the colors, the general public can easily see not only which location is most safe (or unsafe) against fire, but also how effective the collaboration between official and voluntary firefighting is. For more information, see the previous study (Sripramai et al., 2011).

#### REFERENCES

- AUDMP, ADPC. 2003. Reducing Fire Threats to Homes: Piloting Community-based Fire Risk Assessment in Ban Hatsady Village. Safer Cities 9, Case studies on mitigating disasters in Asia and the Pacific.
- Azuma, S. 2009. President Obama's Sense for Language, 70-89. NHK Publishing Co., Ltd. (in Japanese).
- Disaster Prevention and Mitigation. 2007. Act 2007, Royal Gazette, General Release No. 124, Part 52A, dated September 7, 2007.
- Katada, T., Kanai, M., Kodama, M., and Oikawa, Y. 2011. Development of Evacuation System for Huge River Flooding by Workshop. Journal of Japan Society of Civil Engineers, Ser. F5 (Professional Practices in Civil Engineering), Vol. 67, No. 1, 14-22.
- Khunteetao, S. 2007. Ethics of the Volunteers in a Relief Agency: A Case Study of the Ruamkatanyu Foundation. Master's thesis, Mahidol University (in Thai).
- Sripramai, K., Oikawa, Y., Watanabe, H., and Katada, T. 2011. A Study on a Cooperative Relationship to the Improvement of the Regional Fire Fighting Validity - Case Study in Bangkok, Thailand -. Journal of Japan Society of Civil Engineers, Ser. F5 (Professional Practices in Civil Engineering), Vol. 67, No. 1, 55-66.
- Wilcoxon, F. 1945. Individual Comparisons by Ranking Methods. Biometrics Bulletin, Vol. 1, 80-83.