

A Comprehensive and Effective Earthquake Information System: Contributions to Earthquake Hazard Mitigation for a Local Government (2)

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Synopsis

An earthquake information system was installed in the Tottori prefectural office and started its test practice on March 18th in 2004. A questionnaire was conducted on 30 administrators of the local government. The results show that the local government needs more detailed explanation and numerical data. Although there is a gap between administration and investigation, both should cooperate to build the effective program for disaster mitigation.

Keywords : earthquake information, local government, earthquake disaster mitigation

1. Introduction

When a large destructive earthquake occurs, the local government usually becomes the center of rescue and reconstruction activities. Usually, such actions are undertaken in response to intensity level 4 of JMA scale. Information about intensity is received from JMA and through mass media. A local government which has its own seismic network can get this information for itself. Since the intensity is given numerically, it is clear and there is no confusions about initiating emergency plan.

On the contrary, declaring of the end of the alert is not so clear. In many cases, there are few experts in the local government. Furthermore, it is difficult to get more detailed information about seismic activity. Under these circumstances, the local government should decide its own activities.

On the other hand, from the side that produces the information (university researchers and seismic experts), it is widely unrecognized how this information is used. Usually the data effectiveness and data transfer efficiency is not considered. So,

usually the flow of information is one way.

Given this situation, it is important to have cooperation between the researchers and local officials for effective hazard mitigation.

Followings are target points of this project.

[1] Local government administrators are provided with detailed earthquake information, and through discussions with the researchers, the administrators' levels of knowledge and experience about seismic activity are raised. One characteristic of the administrative organization is the reassignment of staff every several years, however, if the process described above is frequently repeated, the potential of the whole administration side can be raised, in regards to knowledge about earthquake activity.

[2] This project will provide materials to the researchers side about what information is helpful in actual earthquake disaster mitigation and how information should be transmitted.

By repeating this process, local earthquake disaster response plan can be improved. This research plan has Tottori prefecture as a counterpart. The reason why the Tottori prefecture is chosen can be seen in the

previous report about this project (Umeda et al., 2004). The system structure of this project and some examples of the homepage are also shown in it.

2. Data utilization

This system started its test practice on march 18th in 2004. After the system level is raised by administrators' practical uses, the system will be fully opened to the public. Presently, the access allowance to the system is only given to the members whose domains are Tottori prefecture, Kyoto university, Tottori university and some other persons who concern with system maintenance.

Since the system is on the testing stage now, the administration does not make this system known to every government staff positively. Practically, only a few limited administrators usually access this system.

In this section, the system utilization for this half an year is shown by applying "Analog" which is a logfile analyzer appeared on the website. According to the limitation of the software, the analyzed interval is 260 days, from August 1st in 2004 to April 19th in 2005.

Total number of access in the period is 2776, which corresponds to 10.7 times for one day. Access from Tottori university that reached 42 % of total access was mainly by the staffs who were cooperative with this project. This high percentage is due to not only the necessity of maintenance of the system but also the high interest for this project as the local university of the district. Access from Tottori local government was 28%. Number of access was 699, which corresponds to 2.7 times for a day. Access from Kyoto university was 29.7%, total number 824 times. Almost of this access might be for maintenance.

Remarkable earthquakes occurred in the analyzed period were as follows; two Off Kii-peninsula earthquakes of M6.9 and M7.4 on September 5th in 2004, Niigata pref. Chuetsu earthquake of M6.8 on October 23rd, Off Sumatra island earthquake of M9.0 on December 26th and Off Fukuoka pref. earthquake of M7.0 on March 20th in 2005 and so on. There were no remarkable event occurred near around Tottori prefecture in this period.

Monthly access number to this system varied randomly and widely, but there was no correlation

between this variation and remarkable earthquake occurrences mentioned above. As the intensity data of felt earthquakes can be seen on the homepage, administrators can get those on the homepage, but any increase of access corresponds to those remarkable earthquakes was not recognized.

The access number of each day of week is necessarily fewest on Sunday. Small numbers on Monday and Saturday can be understandable. Any characteristic tendency was not recognized for other week days.

As for the access number of each hour of a day concentration during the duty hours is reasonable. Large access numbers of both 05 and 22 o'clock may reflect the earnest check before and after the duty.

3. A questionnaire on local government administrators

The questionnaire about the homepage of the system was conducted on 30 administrators belong to the disaster mitigation section of Tottori local government. It was conducted in the period from December 2004 to January 2005, 9 months after the start of the system. The questions are as follows;

Q1 : Have you ever seen the homepage of "Earthquake Information System"?

1. yes
2. no (after checking the homepage, please skip to Q3 and continue)

Q2 : When do you check this page?

1. regularly (concretely when)
2. occasionally
 - 1) when an earthquake occurs near around Tottori prefecture
 - 2) when a big earthquake occurs far from Tottori prefecture
 - 3) in the mood or to waste time
 - 4) else (concretely)

Q3 : Are you interested in the homepage?

1. yes
2. rather yes
3. rather no
4. no
5. else

Q4 : Is the homepage simple?

1. yes
2. no

3. else

Q5 : Are the contents of the homepage useful for your interests?

1. yes
2. no

Q6 : In order to utilize the homepage for earthquake disaster mitigation program, what kind of information should be added?

(your idea:)

Q7 : Earthquake prediction is very difficult today. Even if some kinds of irregular phenomena are observed, we can not judge whether they lead to a big earthquake or not.

Under this circumstances, which opinion do you suggest? -- any information should be opened to public or such confusing information shouldn't be opened --.

1. should be opened
2. shouldn't be opened

(why:)

Eleven administrators replied to this questionnaire. In spite of small number of answers, all administrators belong to the earthquake mitigation section. Although these answers are not sufficient for statistical analysis in number, some common actual ideas can be extracted from them.

The answers are summarized below.

Consequently, some differences between local government administrators and university seismologists can be extracted.

Among eleven answerers, only seven persons have seen the homepage(Q1). Many of them access the homepage when a remarkable earthquake occurs near around Tottori district and scarcely at the occasions of far big events(Q2). All of answerers are interested in the homepage and its materials(Q3). Six persons answered that the page is easy to understand and four not(Q4). As for the seismic wave monitoring page, some answered that the meaning of seismograph was difficult to understand, because it was not familiar in general. All answerers said that the information of the homepage was useful. Especially, many said that the seismic activity of this district can be easily recognized through hypocenter distribution maps. (Q6) requested what information should be added on the homepage. For this question, many constructive ideas were reported. They are as follows;

* Interpretations by experts are needed. Explanations

for materials in Japanese are helpful.

* Evaluation of seismicity, degree of risk and prediction information about future activity are wanted.

* Advices and instructions about refuge to the disaster suffered area are requested.

* Interpretation of the past seismic activity is useful to understand today's activity.

* Show the list of seismometer distribution that concerns with seismic information.

* For government, concrete and numerical information is needed to administrate. Those numerical data with tables should be added on analogue graphs.

From these comments, it can be thought that following two respects should be important.

[a] The administrators of local government need to take more detailed explanations and forecasting informations.

[b] In order to utilize those informations, the concrete numerical data are needed for the government.

Propriety of opening information about earthquake prediction (Q7) is the most anxious theme for investigators of this problem. Ten of eleven administrators answered that those informations should be opened. Only one person was against to open. The reason why those should be opened are as follows;

[1] The observed results should not be hidden.

[2] If some explanations by experts are added with bases, the circumstances will be understood commonly.

[3] Late information is not worthy to be opened.

On the contrary, the objection is following;

[4] Since the local government is not a research institute, it should not distribute those under-investigating information by the name of the government. The government can not answer against any question from inhabitants about those uncertain phenomena.

This problem should not be decided by a simple majority. The project now undergoing is not a personal investigation. If any appropriate discussion can not dealt with the objective idea, the information about earthquake prediction should not be opened by the local government.

4. Consideration and future problems

One year has passed since the system started. As the test interval, not so positive publicity has been done, so number of users of the system was small. It is too hasty to evaluate how this system contribute to the local government. At this stage, substantiation of the homepage is first to do. In order to comprehend the materials included in the homepage, interpretations about them should be appended. It is helpful to add some other general explanations about earthquake.

Introduction of the past seismic activity of the district may be also helpful to understand today's activity. It may be also effective to develop and add information about disaster mitigation program in partnership with local government and university.

The announcement of information to public is very important problem and should be discussed cautiously. Although the number of answerers was small, their opinions were useful and essential.

Consequently, the difference of standpoints between the local government administrators and the university seismologists becomes obvious gradually. The administrators of the government should practice the enforcement of a policy. The practical standard is required to practice anything and this standard should be based upon appropriate bases.

On the other hand, the results obtained by investigators usually involve some amount of error. They don't hesitate to explain that their uncertain results are really uncertain. The obvious differences can be seen among the opinions about Q6 and Q7. The gap of standpoints between government and university is not so small now.

Cooperation and collaboration of both administration and investigation is practically difficult. On the standpoint of administration, this kind of uncertain informations may not be sufficient. On the other hand, judging from the point of investigation,

this kind of project can not be evaluated.

However, we believe that this project is of great use for happiness of society and human beings. Both administration and investigation should cooperate to build up the effective program for disaster mitigation. We think that we should step more and more to promote this 21st century COE project on this conviction.

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**自治体における地震防災に貢献する正確かつ役に立つ地震情報
およびその提供手法に関する研究（２）**

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要旨

地震情報表示システムを鳥取県庁内に設置し、２００４年３月１８日から試験運用を開始した。防災担当者３０名を対象に、本システムに関するアンケート調査を実施した。その結果、行政側としては、より詳しい説明や数値情報を必要としていることが判った。行政と研究の間にはギャップがあるが、両者は効果的な減災計画に向けて連携協力すべきである。

キーワード：地震情報、地方自治体、地震災害軽減