

Study of the risk communication in the Geo-disaster -Report of the local government questionnaire result-

Hisayuki Ishizuka (Graduate School of Natural Science and Technology, Kanazawa University, Japan)

Kouhei Wada (Student of Environmental design, Kanazawa University, Japan)

Masakatsu Miyajima (Institute of Science and Engineering Faculty of Environment Design, Kanazawa University, Japan)

Abstract The earthquake is generated suddenly. As for the lifesaving, 72 hours are said to be critical condition from an earthquake occurrence. The Geo-disaster should be able to prevent human life damage by judging information such as the rain precisely, and evacuating early. However, it is the present conditions that 20 people (average) are dead in one year. The local government sends refuge information to promote early refuge, it is important that the inhabitants take information seriously and practice a refuge action. Do not really go, and are you?

This article shows the findings of the questionnaire by the information dispatch system of the local government. and I clarify the weakness of the system and the social psychology-related problems of the local government person in charge.

Keywords. Geo-disaster , risk communication , refuge action , Refuge information

1. Introduction

70% of the country are a mountainous district, hill countries and influence the weak geological feature structure, and Geo-disaster does not disappear. By the statistics of Ministry of Land, Infrastructure and Transport, around 1,000 a year Geo-disasters occur, and An average of 20 people are dead every year.

The Geo-disaster is a residential area of inhabitants, and, in the high-risk point, an area is appointed by the prevention of Geo-disaster method. In the local government, there is dispatch in Geo-disaster caution information, refuge information depending on the situation of the rain.

I believe that I do not die if I evacuate early.

However, there are really a great many damage by the delay of the refuge information official announcement, cases which fail to get out in time without information being transmitted even if announced.

In addition, it is the problems of the process of the information recognition, the decision making (division making) of the inhabitants side.

To inhabitants "did not think that oneself was rolled up in a mud flood possibly". Mind inclined to security awareness exists, and, as a result, refuge is known to be late.

With the case which was greatly reported, special protection nursing home "life care Takasago" (90 people enter it) of the Manao, Hofu-shi district suffers from it by Yamaguchi heavy rain of July, 2009, and seven are the mud flood disasters that died (cf. photograph).¹⁾

In the Manao district, 43 places of Geo-disaster caution areas were performed designation (2008.3.25 public announcement) of, but there was not these local Geo-disaster hazard map, and correct information did not reach the inhabitants about Geo-disaster outbreak risk.

In addition, the disaster prevention manuals pursued in the tower facilities required at a disaster are undeveloped and should point out the lowness of the disaster prevention awareness of the facilities manager.



(The suffering situation of life care Takasago)

Table.1. Chronological order before and after the suffering

situation	situation
4:18	Heavy rain warning announcement.
7:40	Pref.Yamaguchi announces the Geo-disaster caution information.
8:30	Hofu-city antidisaster headquarter setting.
11:00	The local government starts an appeal of the refuge
12:15	Life care Takasago suffers from it
14:10	Hofu-city is evacuation advisory official announcement in each place

I show then chronological order in table.1.

After life care Takasago suffered from it, evacuation advisory was announced sequentially in the neighboring areas. However, none of advice, instructions for life care Takasago was announced.

The problems that became clear in a subsequent investigation.

- (1) Lack of the risk management & independence disaster prevention awareness of the facilities manager.
- (2) The recognition for neighboring risks is low. Deficiency of the transmission of the risk information.
- (3) Deficiency of the refuge information official announcement.

(2)Geo-disaster (in particular) caution area is not press-agented anymore by inhabitants & facilities though was made designated & public; have a problem.

In the facilities such as life care Takasago, the common knowledge of the disaster risk is in particular indispensable because it is necessary to start refuge earlier than general inhabitants.

(3)The instruction that had a refuge action start at the time of refuge preparations information official announcement seemed to be necessary.

Hofu-shi planned making of the hazard map, but announced that it was non-making with a budget shortfall. In addition, Hofu-shi admitted that precautionary measures for life care Takasago were not perfect. The reason was busy with the correspondence of other disasters.

If if have a strong voluntary disaster prevention awareness of the facilities manager, disaster risk information is transmitted quickly and precisely; seven did not die.

Based on these, I think about a future policy about communication of the disaster prevention information.

I report the summary of the questionnaire that I carried out and the interview to the local government of the dispatch side and clarify problems in the communication that the local government holds now.

2. Summary of the questionnaire

I carried out the questionnaire over from June, 2012 to September.The object is 834 local governments of West Japan. (cf. Table.2)

Table.2. Recovery rate of the questionnaire

area	Kyushu	Shikoku	Tyugoku	Kinki	Tyuu bu Hokur iku	Anonymity	Total
Groups a	233	96	107	198	200	-	834
Answers b	74	25	41	75	122	39	376
Rate b / a	31.8%	26.0%	38.3%	37.9%	61.0%	-	45.1%

Purpose of the questionnaire

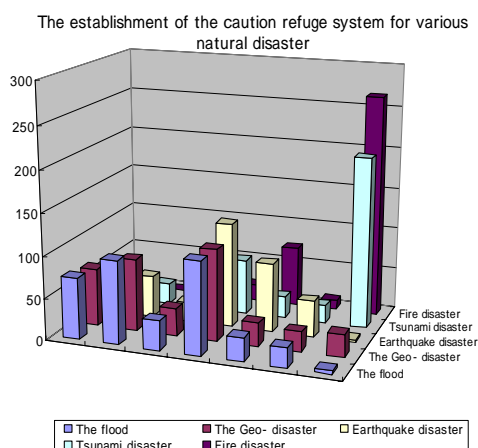
- Summary of the local disaster prevention administration system.
- The enforcement situation of the information communication to inhabitants.
- Summary of the refuge action of inhabitants, the control situation.

The recovery ,45.1%(376 group).

I think that I can grasp an almost nationwide tendency in 21.5% for 1,750 local government groups of the whole country.

3.As a result of questionnaire

(1) Do you prepare for the establishment of the caution refuge system for various natural disaster?



Choice :

- We made the action manual based on a judgment, transmission manual preparation guidelines on evacuation advisory and explained that I publicized it to inhabitants.
- I made the action manual based on a judgment, transmission manual preparation guidelines on evacuation advisory , but have not yet explained that well-known to inhabitants.
- We are making the action manual based on a judgment, transmission manual preparation guidelines on evacuation advisory.
- We examine making with the action manual based on a judgment, transmission manual preparation guidelines on evacuation advisory.
- We do nothing.
- Others
- Not applicable

Fig.1 Maintenance of the caution refuge system

Because an effect to reduce damage by the early refuge to happen relatively frequently is high as for the flood, the Geo- disaster, a maintenance rate is high.

Because a manual is an operative manual of the local governments, the well-known degree to inhabitants is not so high.

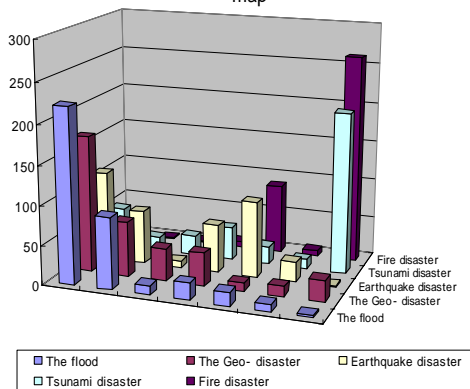
The inhabitants of around 70% of local governments are not informed of the disaster risk at the time of the advice.

(2)About various natural disaster, examination such as the simulation advances, and an area needing caution is shown.Technique of the inhabitants common knowledge includes hazard map.Does the maintenance advance?

In many local governments, I make it as reporting means of the disaster risk to inhabitants and distribute it.

It may be said that very quick correspondence is planned in the local government if I consider it because a progress rate of the erosion control basics investigation is around 50%(Cf. Fig.2).

The establishment present conditions of the hazard map

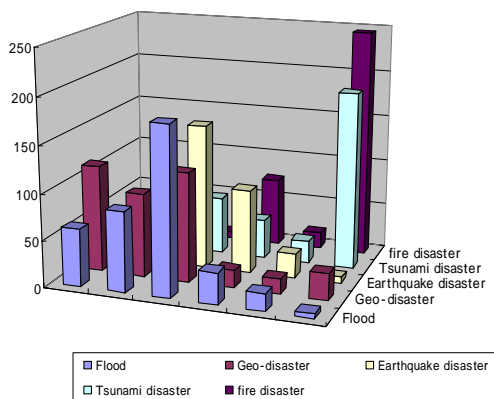


Choice: We made hazard map , distributed it to inhabitants and xplained that the notice matter at the time of the disaster through a local representative (the head of a ward, town's chairperson, disaster prevention leader).
 We madehazard map and distributed it to inhabitants,but have not yet explained that well-known to inhabitants.
 We are making hazard map.
 We examine making with hazard map.
 We do nothing.
 Others
 Not applicable

Fig.2 Maintenance of the hazard map

(3) When I appoint a danger area (caution area), whom of inhabitants is it explained by?

Designated and well-known method of the danger zone



Choice : We explain it for the inhabitants of all households to be related to directly.
 We explain it to local representatives (the head of a ward, town's chairperson, disaster prevention leader) directly.
 We explain it through hazard map, public information.
 We do nothing.
 Others
 Not applicable

Fig.3 Designation and common knowledge of the danger zone

When I appoint a caution area (in particular) and make it public about the Geo-disaster, the local government explaining to all the inhabitants to be related to directly is around 30%.

The inhabitants who do not know that I have a big disaster risk in the rear may considerably exist.

The local government thinks it to be all right by the explanation to a local representative and distribution of the hazard map.

(4)At the time of a disaster, what does transmission, the notice method of the refuge information? (multiple answers allowed)

The information such as the risk of the disaster, the evacuation advisory sends it in multi channel.

It is pointed out that broadcast is difficult to hear by the most common disaster prevention administration radio & loudspeaker van.

In addition, by loudspeaker van, surroundings takes time, and is timely, and information does not arrive; have a problem.

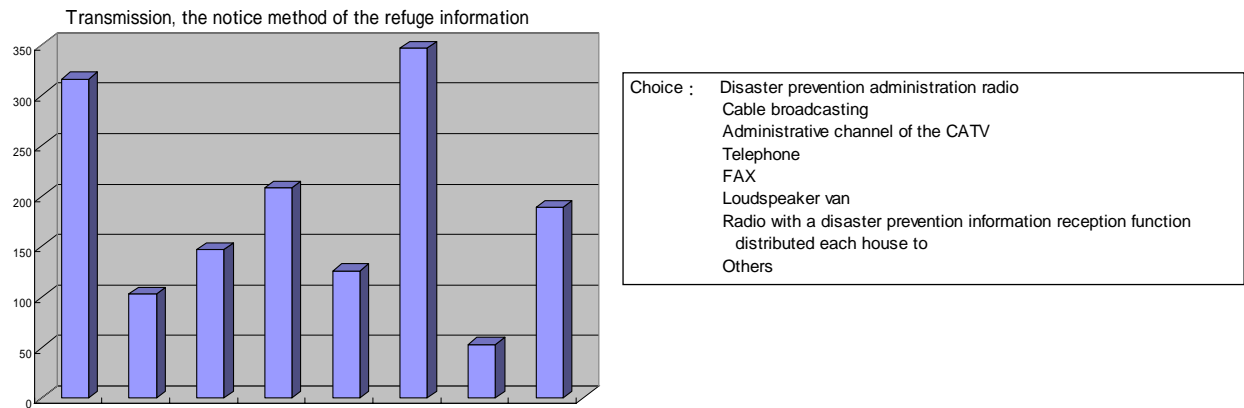


Fig.4 Transmission method of the refuge information

(5)I think that you publicize it with the designation of the refuge, what kind of method do you go ? (multiple answers allowed)

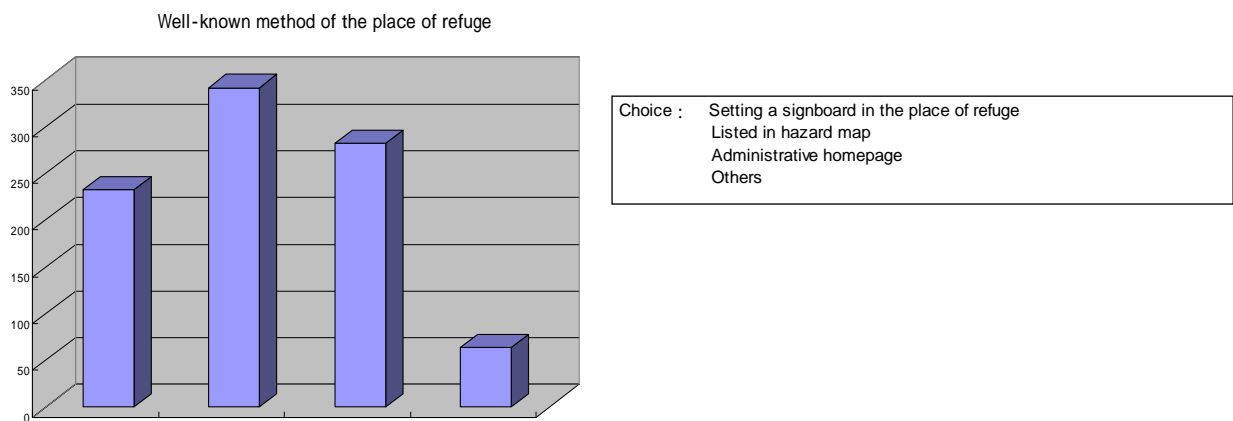


Fig.5 Well-known method of the refuge

A refuge is appointed with all the replied local governments, and an enough well-known action is carried out. However, is a free opinion; "there is the refuge which is not available by a disaster, and it is necessary to review it". Because "the refuge included in the Geo-disaster caution area came out, I examine designated cancellation".

The common knowledge to a refuge action varying in a lot of local governments which begin to appoint a refuge some other time until now is extremely important.

(6)When you announce evacuation advisory, how do you utilize "the Geo-disaster caution information" that the metropolis and districts and a meteorological observatory announce jointly?

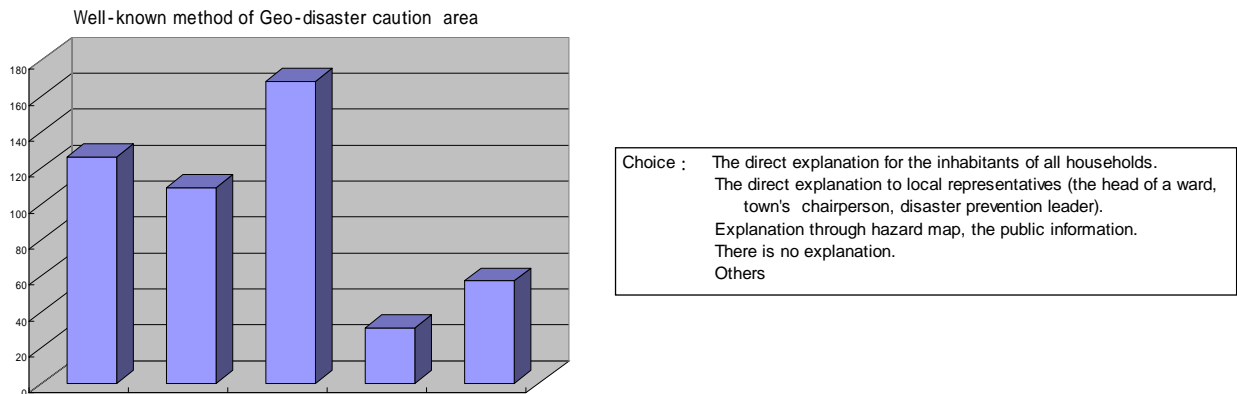


Fig.6 Well-known method of the danger zone

In many local governments, Geo-disaster caution information is used.
 I introduce a free opinion.
 "Mesh expressing a danger zone is big, and districts to send refuge information to in the local government to hold a lot of middle mountains increase and cannot give a quick response".
 "There is not an evaluation about the precision of the information, and can you not state outbreak probability clearly?"
 About the outbreak probability, I think that it is an important point of view in preventing "Okami-boy" effect²⁾ by the wide swing.

(7)The judgment element except Geo-disaster caution information? (multiple answers allowed)

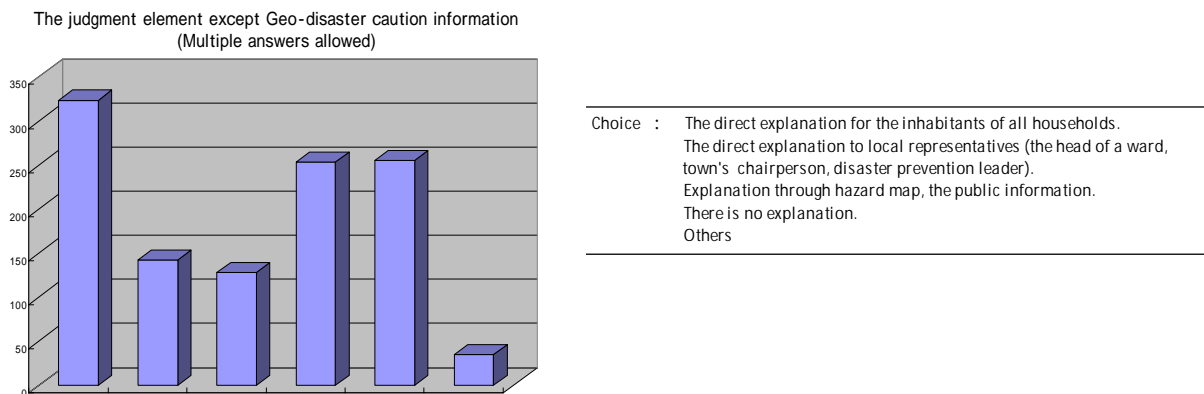


Fig.7 Judgment element of the caution information

Many local governments collect neighboring information to secure accuracy and timeliness of the refuge information.
 Particularly, the local government uses local observation precipitation other than AMEDAS and utilizes the situation for disaster in the judgment of own through the information exchange with other local governments.
 In addition, the local government assumes the abnormal report from inhabitants and the report from patrol important judgment materials.

(8)After April, 2003, have you announced evacuation advisory or an evacuation directive?

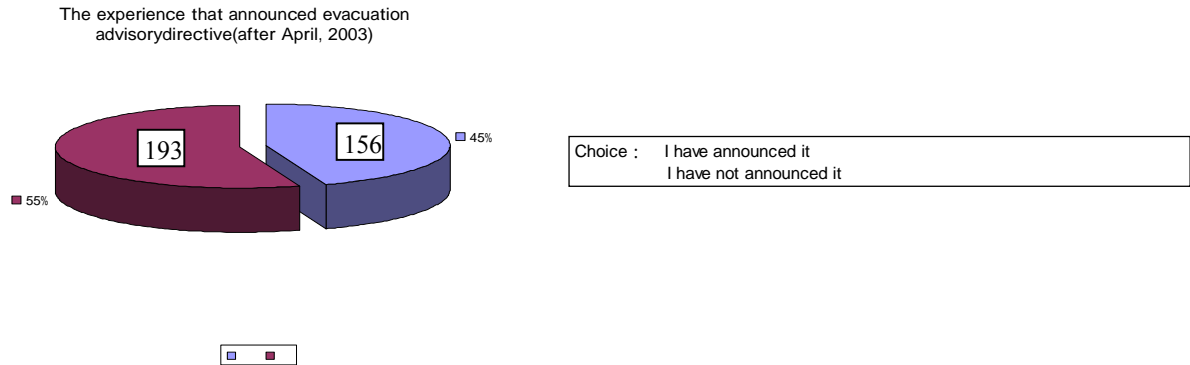


Fig.8 Well-known method of the danger zone

The local government which has announced evacuation advisory is around 45%.

In addition, after asking the official announcement number of times in addition, half was only once.

I interviewed the local government which I had not announced until now.

There is the suffering example of a flood (flood) and the Geo-disaster and establishes the antidisaster headquarter.

However, it is the present conditions to have missed a timing of the official announcement of the refuge information.

The local government without the experience has a problem with information analysis and the judgment ability of a precise and good timing.

In addition, I was asked about the uneasiness for "the Okami-boy effect" by the wide swing in the many local governments.

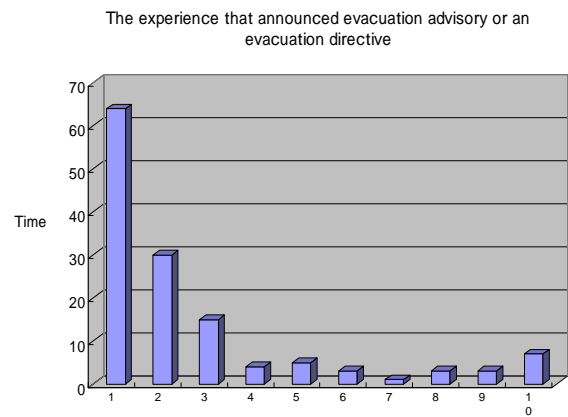
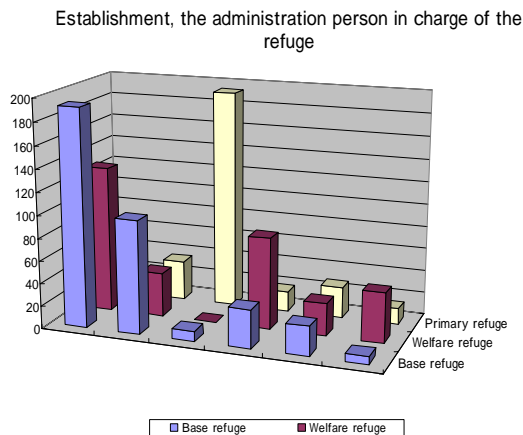


Fig.9 The official announcement number of times of the refuge information

(9)There are many refuges in the local government. Who establishes it?



- Choice :
- A member of administrative occupation. Charge section is decided.
 - A member of administrative occupation. An establishment person in charge (the person in charge) is selected.
 - Local representative (the head of a ward, town's chairperson, disaster prevention leader).
 - Mayor of facilities (the principal, director, the director).
 - Instructions occasional at the time of a disaster.
 - Others

Fig.10 Establishment and administration of the refuge

The staff or facilities manager establishes a base refuge and the welfare refuge in many local governments and runs it.

Local residents' association often establishes the refuge at one time.

By the East Japan great earthquake disaster, there was the example that I suffered from at a refuge thought to be safe.

In addition, the review of the local disaster prevention plan is planned in many local governments.

I was able to confirm that the designation of a refuge safe enough from various disaster risks was necessary in future.

In addition, the staff of the local government decreases, and the staff is not taken for establishment and the administration of the refuge.

The local government thinks about entrusting all it to residents' association or the voluntary disaster prevention organization other than a welfare refuge.

In addition, the staff of the local government decreases, and the staff is not taken for establishment and the administration of the refuge.

The local government thinks about entrusting all it to residents' association or the voluntary disaster prevention organization other than a welfare refuge.

(10) Are a refuge and the evacuation route safe from Geo- disaster?

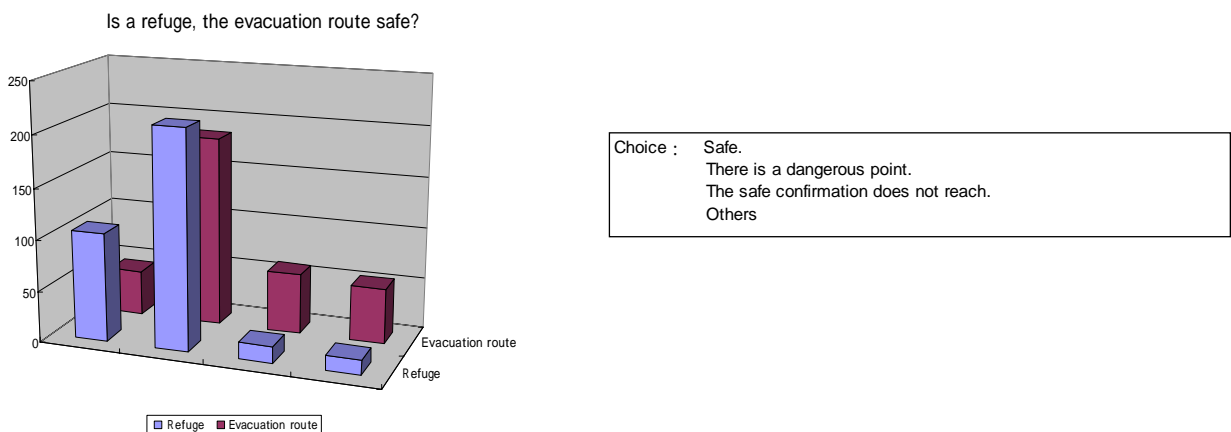


Fig.11 Safety of a refuge and the evacuation route

There are a dangerous refuge and evacuation route in many local governments. Or the local government cannot identify the safety of a refuge and the evacuation route.

As a result of erosion control basics investigation and tsunami simulation, it seemed to be determined, considerably many refuges "were dangerous".

Because there is the risk to suffer from in a place of refuge even if the refuge is appointed now and evacuates by advices, the local government has a hard time for correspondence.

(11) The problems when the local government appoints a refuge? (multiple answers allowed)

Many local governments revise a newly local disaster prevention plan.

The local government appointed every public ownership facility until now in a refuge. However, in consideration of danger factor that became clear in various investigations, there are many examination or local governments carrying it out by a review.

Must the refuge be safe by all disasters? Then it is necessary to review most of the refuges appointing now.

When I take off a caution area and appoint a refuge, the local government has to build newly many facilities. Many sufferings are asked by many local governments.

The refuge has to ensure the security of inhabitants, and there are many local governments thinking that you

should not appoint the facilities which may perform "suffering" by an announced disaster risk(cf.Fig12).

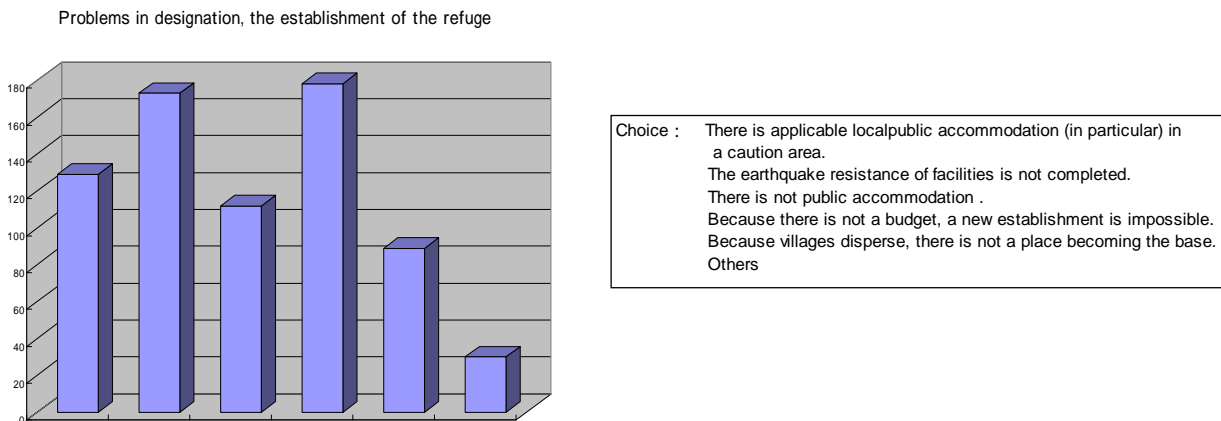


Fig.11 The problem that a refuge has

4.The problem that was talked about by an interview

Based on the result of the questionnaire, I interviewed the person in charge of some local governments.

As content about ,(1) Evacuation advisory, a timing and an area of the instructions official announcement,(2) Method of the refuge instruction,(3) Designation of the refuge,(4)About disaster prevention education.

I decided to report the details and the future measures some other time and extracted a problem in seen communication from an opinion provided this time.

4.1 An official announcement timing and area of evacuation advisory or instructions

The local government having abundant official announcement experience establishes the decision making model in government and private sectors about official announcement of the refuge information.

The local government knows the utilization such as Geo- disaster caution information or the snake graph provided from a meteorological observatory and the prefecture well.In addition, they have environment to get the caution system in one government and private sectors.

On the other hand, the without the experience or local government with a little experience persists in collection and the analysis of data and does not mind the on-site situation and intention of inhabitants.

In addition, because there was not experience, they were afraid of Okami-Boy effect by "the wide swing" more than required and told that I often played moving second.

Evacuation advisory and instructions are the duties that you must not neglect because mayors, town managers, and village headmen keep the life of inhabitants, but, actually, the place that is due to the experience of the disaster prevention person in charge is remarkable.

Therefore, composition skill of the disaster prevention person in charge = security of inhabitants makes ends meet and the weakness in disaster prevention measures has a glimpse in this neighborhood and obtains it.

4.2 Method of the refuge instruction

As even a questionnaire was provided, there were many points that "were danger" in a refuge and the evacuation route which each local government appointed now and knew that there was it.

Even if they appoint an evacuation route, the situation changes every moment and may become in danger.

As for the example that inhabitants did not suffer from during refuge in an evacuation route, it is reported. From these, there were many opinions to want inhabitants oneself to decide the evacuation route.

4.3 Designation of the refuge

An opinion was divided as the free opinion of the questionnaire had it whether it was necessary for all

disasters to be safe.

It is said that many local governments carry out the measures of a dangerous refuge or abolish it and appoint a refuge newly. They are going to try to secure principle safety.

However, the abolition of the refuge which they have already appointed has many problems including the maintenance of the intention of inhabitants and substitute facilities. Therefore there are a lot of local governments to examine a refuge action, the designation of the refuge by inhabitants participation.

It is thought that it is rather desirable from "self-act", a point of view called "the mutual assistance" from past "government dependence". .

4.4 Disaster prevention education.

At East Japan great earthquake disaster, is the refuge from a tsunami; of the elementary and junior high school child, student in the city all the members evacuated safely and were almost praised with "a miracle of Ishinomaki".

Led by Professor Katada of Gunma University, it is given in the background that they practiced tsunami disaster prevention education for elementary and junior high schools of Ishinomaki-shi from 2003.

I have you know what holy human life can save because each one carries out voluntary and aggressive refuge without being similar about the Geo-disaster, and waiting for evacuation advisory or an evacuation directive and think that it is important to carry out mind of "the self-act" thoroughly.

The breeding of the "self-act" and "mutual assistance" consciousness such as spread of disaster prevention people and upbringing of the voluntary disaster prevention organization is practiced in most local governments.

However, it is necessary to examine a more effective method when I think about the present conditions that the number of refuge rate and victims does not turn into.

5.Summary

In our country, I experience many disasters including an earthquake and a flood and the Geo- disaster and have the constant disaster prevention measures.

In addition, with the large-scale disasters such as Hanshin Awaji great earthquake disaster and the East Japan great earthquake disaster, the keyword to reduce a disaster is born, and disaster prevention consciousness wakes to inhabitants each one.

As a result of questionnaire, the local government of the information dispatch side almost does dispatch in conformity with a procedure and achieves a role enough formally. However, is it not said, "I am good" in what I sent it to when I think about the number of real refuge rate and victims?

I perform a questionnaire and an interview to inhabitants of the guard side and, in the future study, want to think about something with "the information that it is easy to evade".

I tell the person in charge of each local government which had cooperation for a questionnaire this time about gratitude some other time.

References

- 1) Ministry of Land, Infrastructure, Transport and Tourism HP: The situation of the Yamaguchi mud flood disaster caused by the July 21, 2009 heavy rain
- 2) Katsuya Yamori, Kimihide Atsumi, Seiji Kondo and Takumi Miyamoto: "Human science of disaster prevention and Disaster Mitigation", Sinyousya.

Hisayuki Ishizuka

Graduate School of Natural Science and Technology, Kanazawa University, Japan
ZIP 920-1192 Kakumamachi, Kanazawa-shi, Ishikawa
e-mail: h_ishizuka@stu.kanazawa-u.ac.jp

Kouhei Wad

Student of Environmental design, Kanazawa University, Japan

ZIP 920-1192 Kakumamachi, Kanazawa-shi, Ishikawa
e-mail: kwada.kanazawa.u@gmail.com

Masakatsu Miyajima

Institute of Science and Engineering Faculty of Environment Design, Kanazawa University, Japan
ZIP 920-1192 Kakumamachi, Kanazawa-shi, Ishikawa
e-mail:miyajima@t.kanazawa-u.ac.jp