

PROBLEM OF DISASTER PREVENTION ASSESSMENT AND THE CITY DISASTER PREVENTION PLAN BASED ON THE CIVIC PARTICIPATION WORKSHOP

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Abstract: In this study, we grasped the black spot by the disaster prevention assessment investigation and damage assumed Onojo-shi as a case study. In addition, we performed the disaster prevention refuge simulation training and practice by the civic participation workshop for local inhabitants. Furthermore, we arranged the information that should reflect a disaster prevention city plan made from the result of the workshop and showed the effectiveness of the workshop.

Keywords: Disaster Prevention Assessment, Civic Participation Workshop, Disaster Prevention City Plan, Local Disaster Prevention Power (grass-root disaster prevention power).

I. INTRODUCTION

The East Japan great earthquake disaster that occurred on March 22, 2011 and the review of the damage assumption of the earthquake are performed in country and prefectures. As a result the review of the area disaster prevention plan is pushed forward in each cities, towns and villages. By the review of the local disaster prevention plan, it is with a flow to re-examine a plan to the review of the damage assumption of the earthquake.

At first, in this study, the grasp of the black spot by the disaster prevention assessment investigation and damage assumed Onojo-shi as a case study. In addition, we assumed disaster prevention assessment and performed the disaster prevention refuge simulation training and practice by the civic participation workshop for local inhabitants. We later grasped the problems in the disaster prevention at the district level. Furthermore, we arranged the information that should reflect a disaster prevention city plan made from the result of the workshop and showed the effectiveness of the workshop.

II. THE DAMAGE ASSUMPTION BY THE DISASTER PREVENTION ASSESSMENT INVESTIGATION

1. Investigation method

In the disaster prevention assessment investigation, we arranged the following items and performed the damage assumptions for every disaster.

1) Disaster induction

- Distribution and the scale of the active dislocations and activities
- The weather properties that bring a disaster

2) Disaster factor

- Topography conditions
- The demographic, social and economic conditions
- City structure (housing, lifeline)
- Disaster prevention-related institution (a refuge, place of refuge)
- Disaster black spots

3) Disaster history

- Disaster contents in the past, damage situations

4) Land use change

- The changed situation of the land use

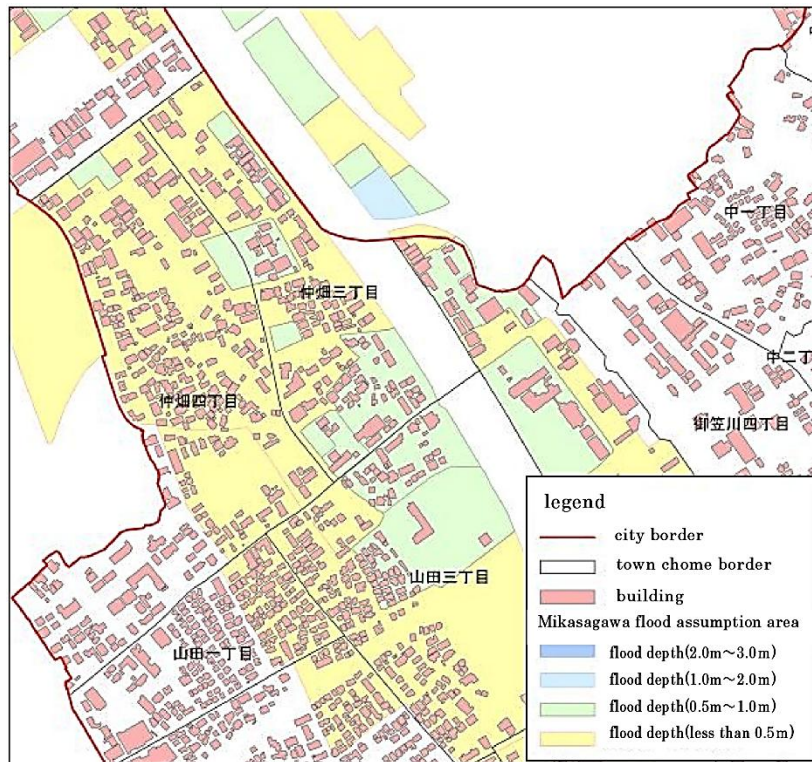


Fig. 1 Damage Assumption Method of the Flood

2. *Damage Assumption of the Storm and Flood Damage*

1) *Damage assumption of the flood*

The damage assumption of the flood demanded the situation of the severe inundation that was assumed when Mikasagawawas once overflowed by having rained about 100 years ago, by simulation in consideration for the maintenance situation of the river channel in Mikasagawa as of May, 2009. We performed it based on "Mikasagawa inundation assumption area" and "an inland water flooding assumption area" of 100 years probability carried out in Onojo-shi.

Fig. 1 shows the damage assumption of the flood with the building included within the inundation assumption area according to depth of the inundation.

We judged a building with more than 1.0m of depth of the inundation with the building which suffered remarkable damage and hung the average number of people in one building of the district to the number of these buildings and calculated the number of the refugees.

2) *Damage assumption of the earth and sand disaster*

The damage of the earth and sand disaster was assumed based on earth and sand disaster caution area" appointed by Fukuoka. In the earth and sand disaster caution area, an area record is made. The number of the buildings in "the area of the land which can cause remarkable danger" is generated in that. We multiplied the number of these buildings by the mean number of people in one building and calculated the number of the refugees.

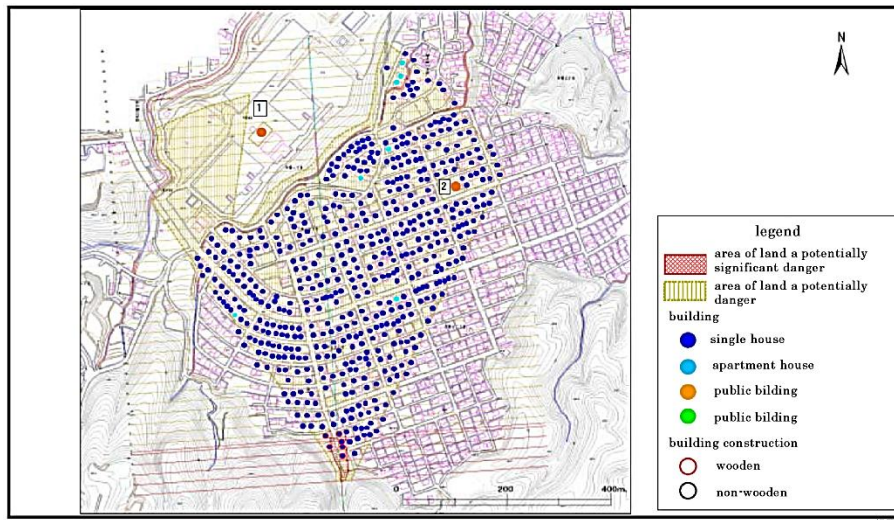
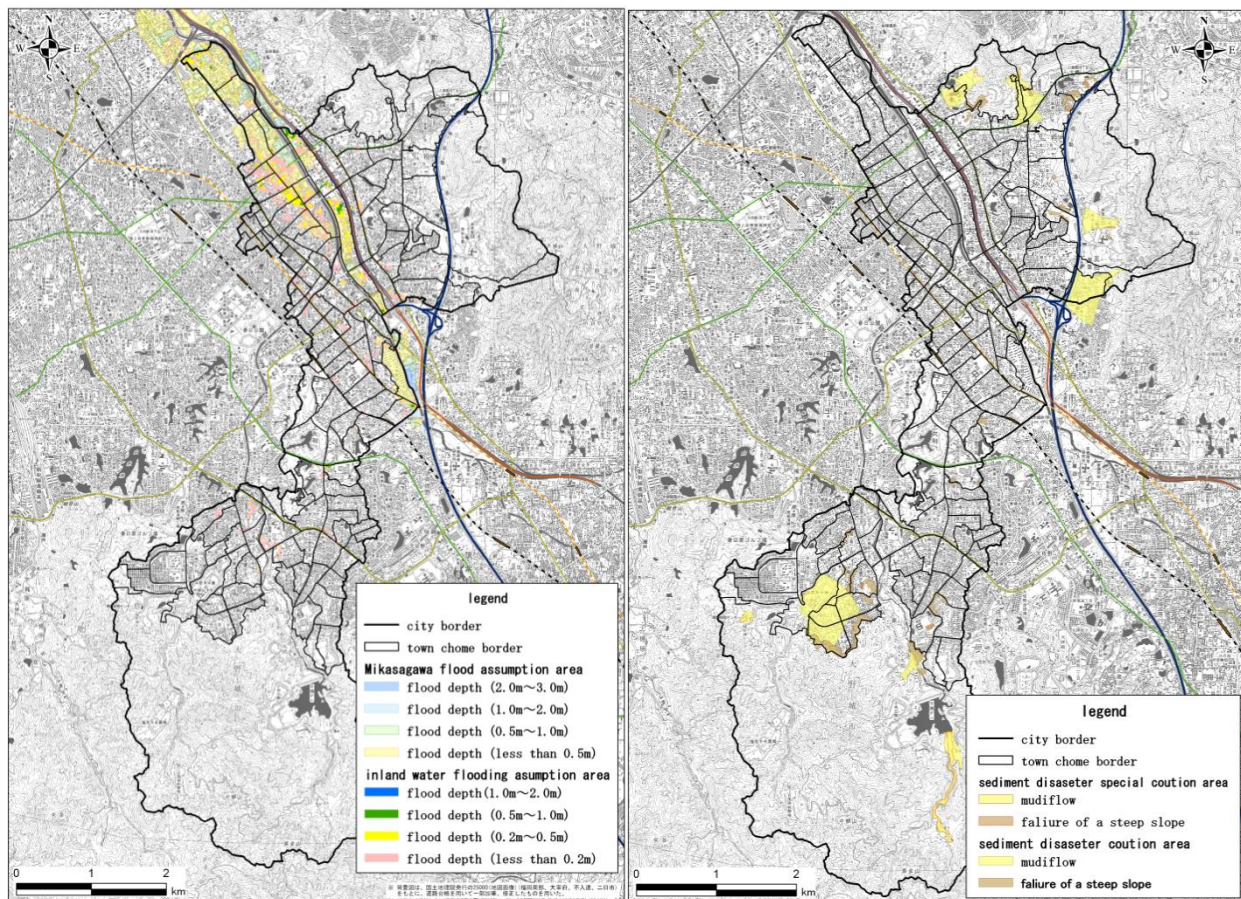


Fig.2 Damage Assumption Method of the Earth and Sand Disaster

3) Figure of degree of risk evaluation

Fig. 3 is a figure of degree of risk evaluation that we made based on the danger zone that we used for a damage assumption.



(a) (b)

Fig.3 Figure of Degree of Risk Evaluation (a) flood,(b) earth and sand disaster

3. Damage Assumption of the Earthquake

We examined the earthquake damage of city limits in consideration of the findings such as disaster factor, disaster history, the land use change based on "disaster prevention assessment working papers (Fukuoka, March, 2012) about the earthquake" carried out in Fukuoka.

In the prefecture, there are six dislocations of "Azuma Ogura dislocation", "Nishiyama dislocation", "defense dislocation", "line dislocation", "Fukuchi mountain dislocation", and "the Umi dislocation" as main active faults, and it is Keiko dislocation that bring serious damage among these in Onojo-shi.

We show a figure of liquefaction degree of risk evaluation to Fig. 5 and in Fig. 4 on a seismic intensity distribution map assumed by an earthquake to assume Keiko dislocation cause.

It is assumed with nine places of damage of 577 complete destructions, partial destructions of 432, death tolls of 42, injured people of 909, number of the refugees are 2, 293 people of the building, 215 of damage places of waterworks, 108 damage places of the sewer, 9 city gasin Onojo-shi by this earthquake.

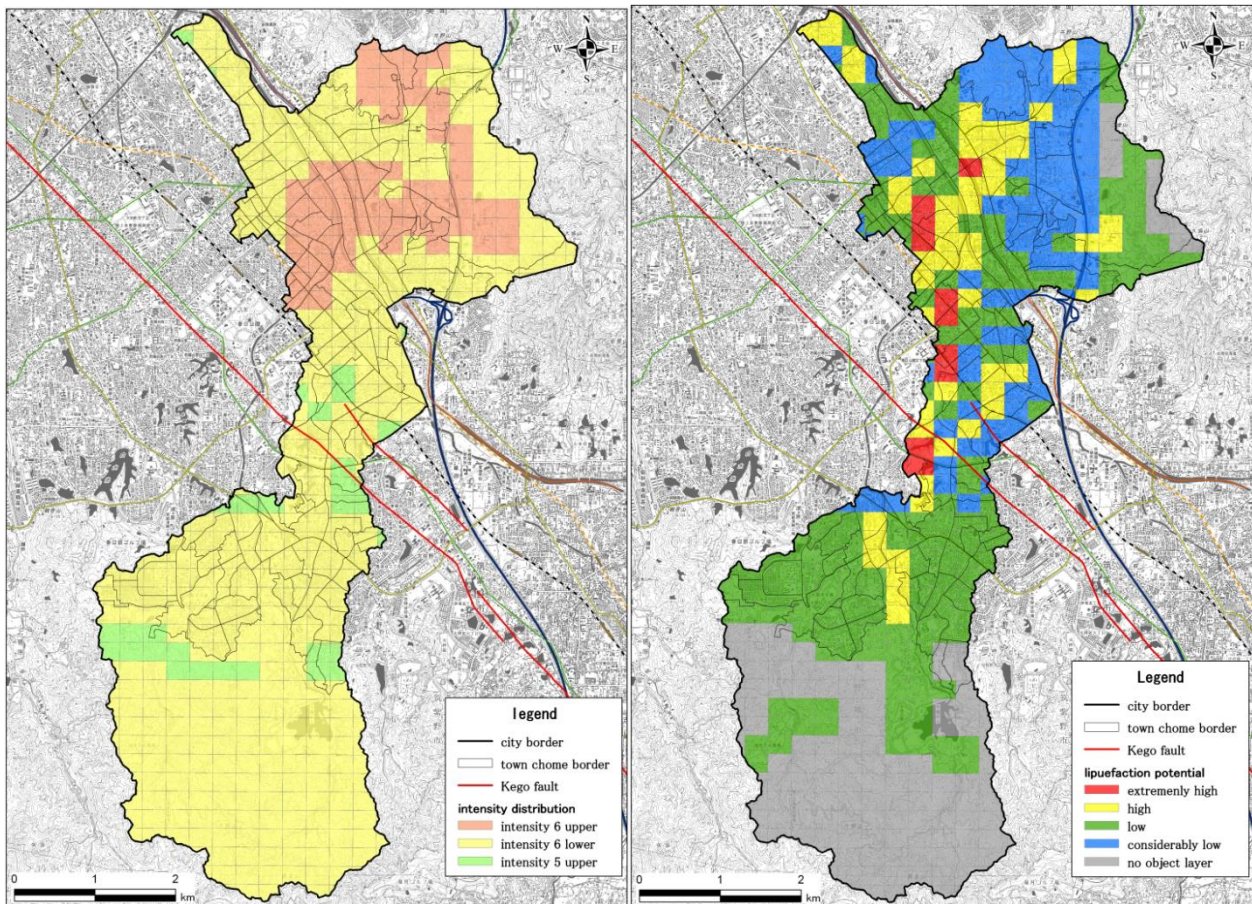


Fig.4 Seismic Intensity Distribution Map Fig.5 Liquefaction Degree of Risk Distribution Map

III. THE DISASTER PREVENTION TRAINING BY THE WORKSHOP

1. Purpose of the Training

"Exchange of opinions" in the fire training that they carried out around big "map" while adding various "information" with all the local participants and they put the "joint ownership" with aspects of damage of the town, strength, the weakness for the disaster. A method of refuge with experience of the training and the method of the training, and streamed down it in various places of the district.

2. Contents of the Training

They held the training according to community and made a group with plural administrative section units and trained community. One community is formed in 6-7 administrative sections in Onojo-shi.

The participants assumed around 5-10 people in one group and chose the officers who wrestled for local disaster prevention in wards.

The training assumed the case that an earthquake produced basically and they divided it into twice the time and carried them out.

1) Contents of the first time

Step1: work

*Railroad, a building, a park, vacant land, a parking lot, a river, a waterway and the frame of the everyday town were shown.

*They wrote as a dangerous place, institution, an institution helping disaster prevention, a person helping disaster prevention, a necessary person for the help, an institution and let strength after the disaster outbreak.

Step2: summary and presentation

* They begin to write that they are careful of the characteristic of the town, a time of peace or a disaster on tag while watching a basic map of Step1.

* The representative of each group presented to share the contents with all the participants.

Step3: Recognition of the aspects of the damage

*City hall distributes map (hazard map) to understand what kind of damage is assumed. They bring this map in the home, and participants confirm it respectively.

*We walk the routes from the homes to a refuge beforehand to examine a refuge method by the second training mainly and imagine the situation at the time of confirmation and the disaster of the situation of the time of peace.

2) Contents of the second time

Step1: work

* From the first map which they distributed last and disaster history, the participant writes in an assumed place of the damage and their home.

Step2: the examination of the refuge method

* They examined the refuge route to a place of refuge by each person while they confirmed the situation of the position of a place of refuge and the refuge, a road and the route based on a basic map. They imagine and write in it on a basic map.

Step3: examination (what they should perform other than refuge):

* They investigated what they should perform other than refuge while imaging the damage situation in the governorate and dig into action content (including refuge support, safety confirmation, intelligence, the emergency relief).

Step4: summary and presentation

* They examined the safer refuge route in the district while exchanging opinions in participants based on the refuge route which they wrote in and confirmed the point that they should warn in refuge, the distance to a refuge.

* Classifying while considering role allotment in progress at time and arrange what they should perform other than refuge (Fig. 6).

The representative of each group presents to share the above-mentioned examination contents with all the participants.

Item	time progress		Problem	solution
	1 hour after	2or3 hours after		
tale shelter				
Information gathering ,communication				
ascertainment of someone's safety				
refuge assistance				
rescue				
put out a fire				
allowance				
other				

Fig. 6 Rearranging Image to Perform Other than Refuge

3. Training result

1) The number of participants

Holding this training for two times, the total of participant became 331. We showed the number of participants according to the districts in Table 1.

TABLE1
Participant of the Training

(a) The first of the Training							
Tyuoutiku community		Higastiku Community		Kitatiku Community		Minamitiku Community	
Nov. 29(Thu.), 2012		Dec. 3 (Mon.), 2012		Nov. 11(Tue.), 2012		Dec. 13(Thu.), 2012	
Kamiori	8	Inokuti	8	Kamitutui	6	Usikubi	6
Simoori	6	Otogana	7	Sakaemat	6	Wakakusa	7
Higasiiori	5	Otoanadai	9	Simotutui	6	Hiranodai	5
Simooridanti	6	Otoanahigasi	6	Zassyonokuma	5	Tukinoura	7
Kwarada	2	Kamabuta	7	Yamada	6	Minamigaoka1	6
Sirokibaru	6	Oike	6	Hatadume	6	Minamigaoka2	6
		Naka	4	Nakajima	6	Tutujigaoka	6
Total	33	Total	47	Total	41	Total	43
(b) The second of the Training							
Tyuoutiku community		Higastiku Community		Kitatiku Community		Minamitiku Community	
Feb. 6(Wed.), 2013		Jan. 11 (Fri.), 2013		Feb. 21(Tue.), 2013		Jan. 17(Thu.), 2013	
Kamiori	8	Inokuti	7	Kamitutui	6	Usikubi	6
Simoori	4	Otogana	4	Sakaemat	5	Wakakusa	4
Higasiiori	5	Otoanadai	10	Simotutui	4	Hiranodai	9
Simooridanti	6	Otoanahigasi	6	Zassyonokuma	5	Tukinoura	4
Kwarada	5	Kamabuta	7	Yamada	6	Minamigaoka1	6
Sirokibaru	5	Oike	6	Hatadume	8	Minamigaoka2	9
		Naka	7	Nakajima	5	Tutujigaoka	10
Total	33	Total	47	Total	39	Total	48

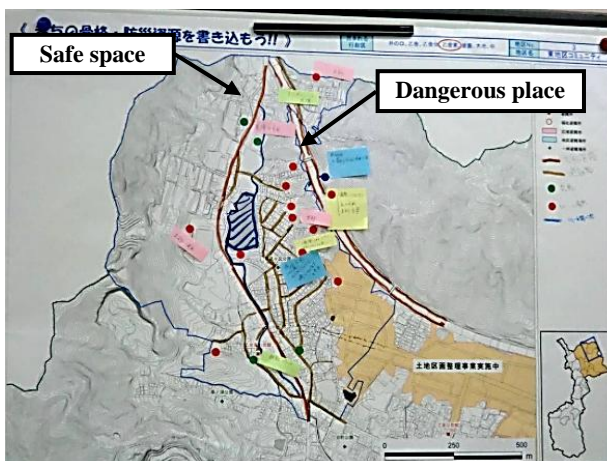
2) Result of the training

We show an example of the drawing which were made by this training in Fig. 6.

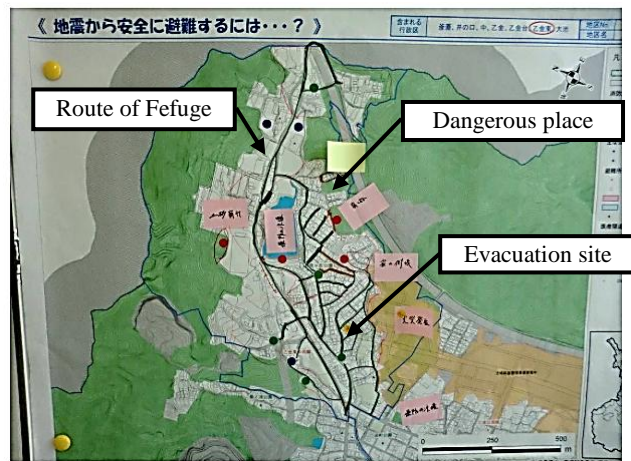
In the first training, a dangerous place, institution, the institution which helped disaster prevention person who helped disaster prevention, a necessary person or institution of the help were made.

The following things had the strength and the weakness pointed out in disaster prevention achieved by the first training.

- The places that were helpful at the time of a disaster included a convenience store and a grocery store, daily necessities shop. They were expected as a storage base.
- The district where land readjustment was carried out was appreciated in safety because of relatively many large roads.
- It was recognized that they could not grasp the information of the person requiring nursing care from a problem of the personal information in community.
- Road width is narrow in the old district, and a road is at increased risk for being blocked up when walls made of blocks and a stone wall collapse.
- Many districts do not hire fire engines where narrow street exist.
- A refuge has numerical variability by an administrative section.



(a)



(b)

Item	time progress		Problem	solution
	1 hour after	2or3 hours after		
tale shelter	The evacuation shelter in temporary location	Shelter to shelter or home	• Sloping road is often • Lack of shelter	• Ensuring as shelter Otogana hospital
Information gathering ,communication	• Voluntary disaster prevention organization set → Disaster response headquarters installation, check for a role	• Establishment of disaster countermeasures office • Confirmation of the disaster location		
ascertainment of someone's safety	Safety Confirmation			
refuge assistance		Support activities of the person requiring assistance	Requiring assistance who are often elderly high rate	
rescue	Check if there is no person buried alive			
put out a fire	Implementation of the initial fire extinguishing		Location of fire engine approach is difficult roads are narrow in many cases	Use of water in the pond
allowance	Rescue of injured			
other			Disaster prevention radio	

(c)



Fig.6 Result Drawing of Training(a)O district, (b)S district, (c) Table Process.

By the second training, we examined a refuge method and support of the refuge damages. However, there was the administrative section that was over the way because there was much volume of the training. It is necessary for us to re-examine the contents in future in time for training. In addition, by the second training, a difference has been seen in high disaster prevention awareness by an administrative section. In the high administrative section of the disaster prevention awareness, the role of the voluntary disaster prevention of organization became clear.

IV. REFLECTION TO A DISASTER PREVENTION PLAN

1. Reflection to a local disaster prevention plan

The head of each local government consults with each disaster prevention meeting about the local disaster prevention plan and the plan that determined the duties that should handle disaster prevention concretely. The local disaster prevention plan determined a policy of the disaster prevention in a big frame. Therefore, as directionality of the disaster prevention plan, the authors perform the workshops such as disaster prevention drills, and it is desirable to show that the plan focuses on reflecting the opinion for an individual plan. In addition, through a workshop, the author think that it is effective to bring up local voluntary disaster prevention organizations and able to go ahead through the reinforcement of the local disaster prevention power.

2. Selection to a disaster prevention city plan made

A natural condition, a community are based on the peculiar situation of the city, and "the disaster prevention city plan made" is a plan to realize the generally high quality city area that was considered in security, relief, comfort routinely on the basis of solving problems in the disaster prevention. We performed the present situation evaluations such as "disaster degree of risk judgments" to draw up this plan and make a problem plan, a basic idea, clear aim, and the institution maintenance of "the city level" or the improvement of the crowd city area set the measures of "the district level". The disaster prevention city plan made is placed for the disaster prophylaxis of the local disaster prevention plan and carries a role to let the city planning master plan that is a basic policy of the city planning of cities, towns and villages reflect it. About the measures of "the district level", the author think that it is effective to take measures about the problems that the local inhabitants who got nervous in a workshop. It is necessary for a lot of problems indication to regard the existence of narrowness and the walls made of blocks of the road width as it is dangerous to take measures in the example of this workshop with precedence on these trouble spots. About the road in particular, we put it on the examination of the refuge course, and it is desirable to determine priority of the maintenance.

V. CONCLUSION

In this article, we examined "a local disaster prevention plan" and the problem regarding "the disaster prevention city plan" that was driven by enforcement from the viewpoint of examination work by the workshop by the participation of local inhabitants.

Because the result of the disaster prevention assessment was far apart from the actual feeling for the local inhabitants that in the past did not have the suffering experience, it was effective to share information through a workshop, and to simulate an experience at the time of the suffering. In addition, it is a problem to make reflecting results provided in a workshop for disaster prevention assessment, "the disaster prevention scenario assessment" that assumed refuge for a second disaster, in a long term.

In the development of the local disaster prevention plan, we incorporate the workshops such as the disaster prevention drills of local inhabitants in a plan and think that it is effective to establish the enforcement system which cooperates with administration and being able to go ahead through the reinforcement of the local disaster prevention power. In addition, it was shown in the action of the local disaster prevention power reinforcement that had been already carried out in an administrative section credit in community in a workshop that the level difference by the administrative section was remarkable. We examine the local factor that this level of difference is borned as, and it is necessary to wrestle for effective measures for the improvement of the local disaster prevention power (grass-root disaster prevention power).

It is desirable by the disaster prevention city plan made to reflect the problem point from a local viewpoint pointed out in a workshop and reflects an evaluation of the disaster prevention scenario assessment from a point of view called "the prior revival" and thinks that it is a problem to establish "plan assessment technique" to devise priority of the municipal facilities maintenance.

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