A NEW DISASTER MANAGEMENT MANUAL FOR IMPROVEMENT OF COMPREHENSIVE DISASTER PREVENTION

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ABSTRACT: For the realization of comprehensive disaster prevention, three balanced measures should be considered, Disaster Mitigation, Preparedness/Disaster Response, and Optimum Recovery/Reconstruction Plan. However, most existing disaster management manuals cannot contribute to improve the ability of each countermeasure. In this study, the authors propose A New Disaster Management Manual. This manual makes it possible to sort out potential problems, review/conduct countermeasures, and assess their effects. As a result, users can create a good environment for the disaster management improvement.

Key Words: *Disaster Management Manual, Disaster Management Measure, Database*

INTRODUCTION

Ideal disaster management measures are to be conducted in the following balanced manner: "Disaster Mitigation", "Preparedness/Disaster Response" and "Optimum Recovery/Reconstruction Plan". "Disaster Mitigation" means efforts to prevent hazard from becoming a disaster. "Preparedness /Disaster Response" means proper measures to prevent the disaster from affecting widely. "Optimum Recovery/Reconstruction Plan" means promptly recovery and reconstruction from disaster to minimize its effects. Comprehensive disaster management will not improve without user's imagination of the real disaster situation or the implementation of these three measures.

It is needless to say that the disaster management manual has to contribute to the improvement of the overall disaster management. However, most existing manuals are prepared mainly aiming at "Preparedness / Disaster Response" (see **Figure 1**). They are "Government prepared," with many problems such as ambiguity over where the responsibility lies and characteristics of the region and organization. Those are "thick printed material," difficult to edit and evaluate. Such manuals do not help to the overall disaster management improvement.

Recent natural hazards in Japan, such as the "1995 Kobe earthquake" and the "2000 Tokai flood" are obvious proofs of the flaws found in existing manuals. Considering these problems and current seismic activities in Japan, it is fair to say that the most urgent and important issue for every level of administration from central government to private corporations and individuals is to develop an environment which improves overall disaster management and to prepare manuals which consider this environment.

Based on these points, the authors propose the "New Style Disaster Management Manual". Organizations and regions, who actually use this proposed manual, can sort out potential problems, review, conduct and assess countermeasures so that they can create a good environment for the

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disaster management improvement (see **Figure 2**). The authors concluded that there are three

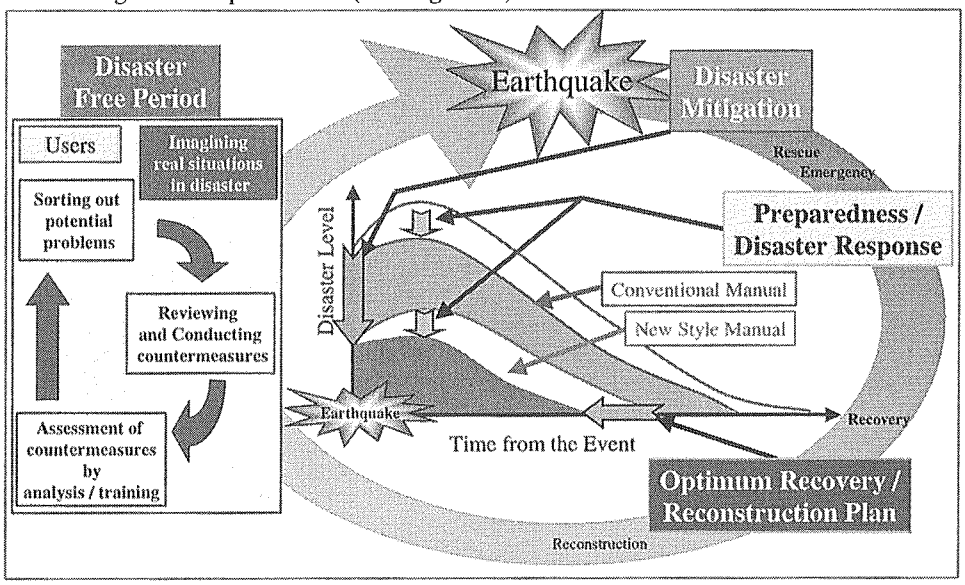

Figure 1. Difference in the effects of disaster reduction capability between conventional type and new type of disaster management manual

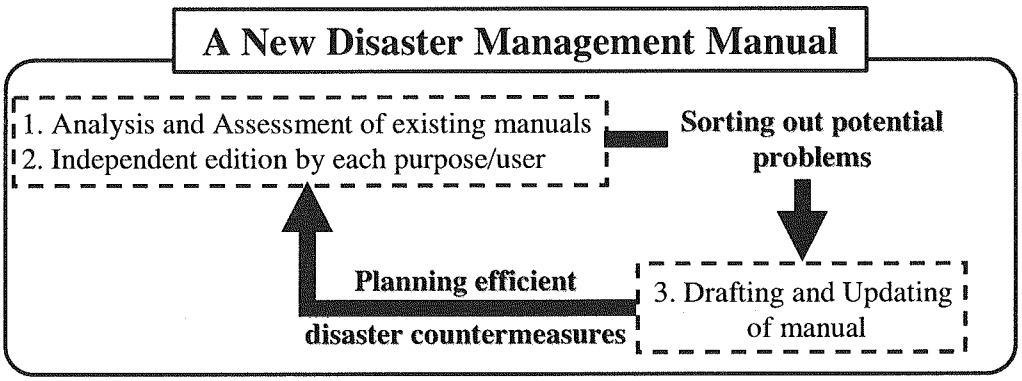

Figure 2. Flowchart of A New Disaster Management Manual

necessary functions in order to achieve the realization of this manual: "Analysis and Assessment of existing manuals", "Independent edition by each purpose/user", and "Drafting and Updating of manual".

ORGANIZATION OF THE MANUAL

In a New Disaster Management Manual, the scenario of damage estimation is incorporated. So time flow and characteristic or scales of damage are considered into this manual. This manual has six indexes that are important for analyzing and evaluating disaster management defined scenario based on damage estimation. These contents are "Responsible organization", "Service contents", "Term of

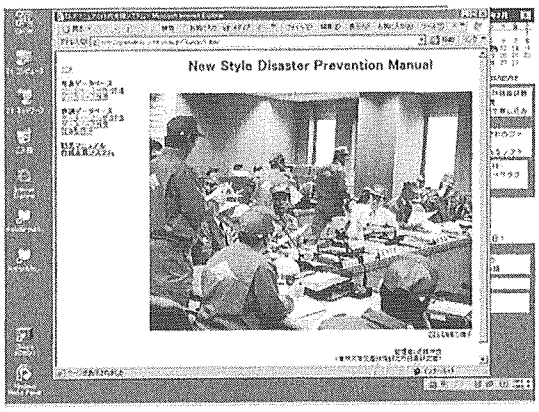

Figure 3. An instance of New Style Disaster Management Manual

measures (Relatively)", "Time to start and finish measures of an event (Absolutely)", "Work loads (man x day)". A relational database is constructed from those indexes. This database is used in web application as disaster management manual (see **Figure 3**). Therefore, if users can use Internet/Intranet , they can use this manual as well.

MAIN FEATURES

Analysis and Assessment of existing manuals

For the realization of comprehensive disaster management, it is necessary to sort out problems of existing manual. Manual should be analyzed and assessed rationally/objectively. However, most of the existing manuals are "Thick books", it is difficult to judge the quality of manual like relations between each items and the whole balance of contents.

In this study, the authors prepare the function, "Analysis and Assessment of existing manuals". It is easy to know the relation between each works from indexes set at previous section "Organization of the Manual" excluding "Work loads", therefore it is easy to analyze contents of present manual rationally/objectively from various points of view. **Figure 4** presents an example of analysis and assessment of the disaster management manual of a big city in the Tokyo metropolitan region. The x-axis is "Time to start from an event". The y-axis represents different "Responsible organization". The z-axis is "Amount of the work" to be done. From the x-axis, we can see actions are not well pointed out after 6-24 hours and four days. Also from the y-axis, it can be seen that amount of work is not balanced among organizations.

Independent edition by each purpose/user

Although it is essential to analyze/assess disaster management manual from a whole organizational view, this is not enough. Contents of the total manual are improved, if users know how they should act personally and who/when to do some services. To pick information of a latest disaster and to know user's need, directly by accessing the manual is important to assess the real situation of a disaster.

In this study, the authors prepare the function, "Independent edition by each purpose/user". Users choose necessary conditions from indexes set at previous section "Organization of the Manual" excluding "Work loads", picking up necessary items from whole manual, so they can get idea about their own role, during a disaster. **Figure 5** shows the application of this feature in the existing government disaster management manual as presented in **Figure 4**. This figure shows how a General Manager, (normally mayor or governor) of an organization can select his own responsibility just by clicking a button on his position.

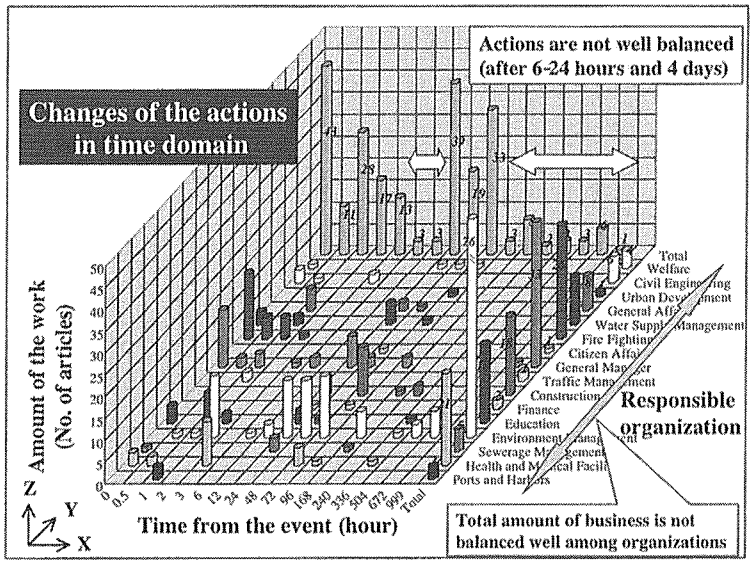

Figure 4. Sample of analytical result of existing manual (after Meguro, 2001)

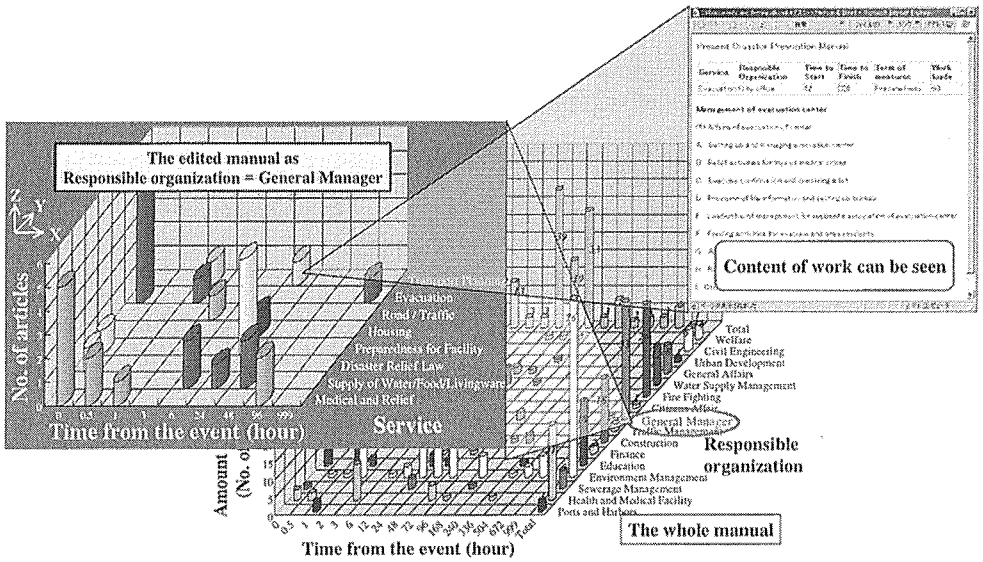

Figure 5. Independent edition by each purpose/user

Drafting and Updating of manuals

The process of Drafting and Updating the disaster management manual by real users is very important and useful occasion to study and understand the contents of the manual, that is, sorting out potential problems and reviewing/assessing measures so users contribute to the improvement of comprehensive disaster management measures. However, most existing manuals are "Government prepared", which

cannot be improved through the process of reviewing the manual by the real users.

In this study, the authors prepare the function, "Drafting/Updating the resulting manuals". With this function, users can review their disaster management manual by themselves. For instance (see flowchart of **Figure 6**), in case of considering the manual of some organizations of the disaster countermeasures office, each member of this organization drafts his/her own manual by him/herself with information people should consider at each condition set by indexes. And members compare and discuss their own manuals, so they can sort out potential problems and consider and assess disaster prevention measures. It follows that when the manual of this organization is completed, members can understand not only problems of their organization/area but background of each item through this process, so they will be able to do measures without manual smoothly after a disaster occurs.

The features of "Drafting and Updating of manuals" are two. Firstly, users easily know which and how many actions should be added, if potential problems can be found, through analysis of present manual. Secondly, users easily know how many actions can be decreased, if they do proper measures before the event. **Figure 7** gives an example of these changes.

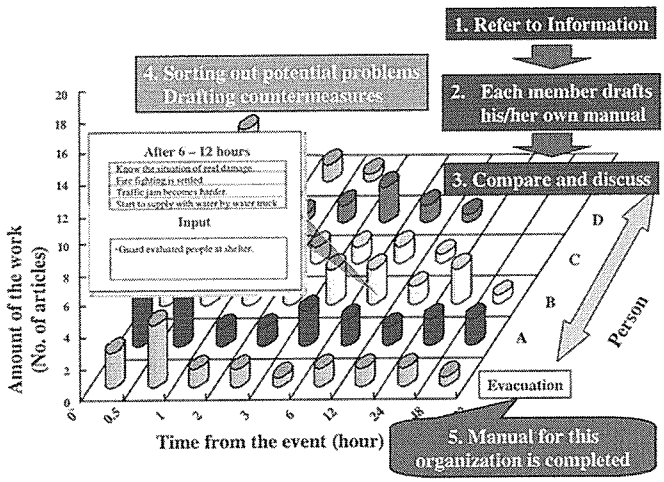

Figure 6. Flowchart of drafting a manual of an organization

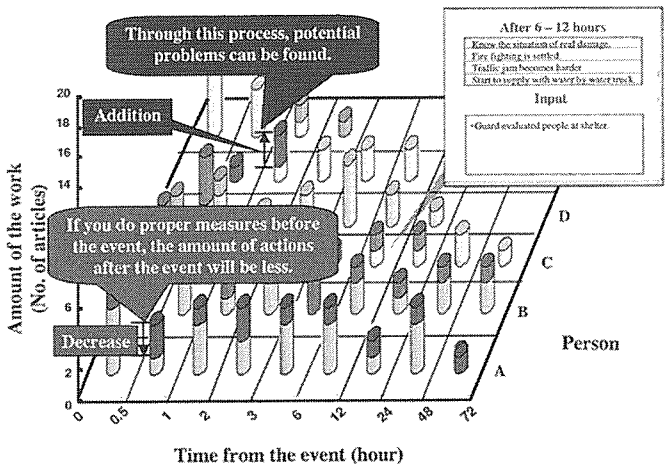

Figure 7. The features of the function, "Drafting/Updating the resulting manuals" (after Kondo et al., 2001)

CONCLUSIONS

In this study, the authors propose a "New Disaster Management Manual". As the result of incorporating the scenario of damage estimation, setting indexes, and construction of relational database, three functions are achieved: "Analysis and Assessment of existing manuals", "Independent edition by each purpose/ user", and "Drafting and Updating of manual". Organizations and regions can create a good environment to sort out potential problems, review, conduct and evaluate countermeasures like the flowchart in **Figure 8**. These can effectively improve the disaster prevention.

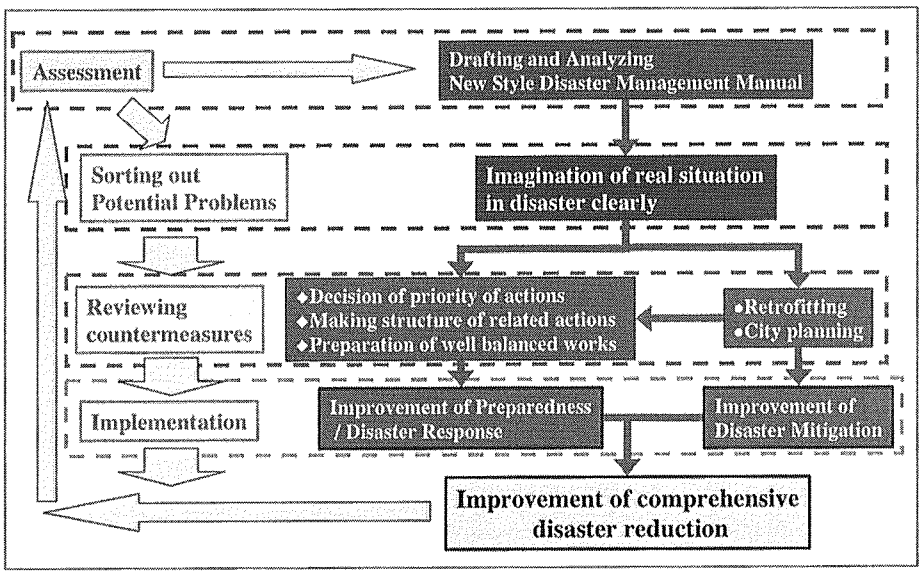

Figure 8. Flowchart of using of proposed manual

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