THREE TYPES OF RISK COMMUNICATION PATTERNS AND CORRESPONDING MODELS DISCERNED FROM THE ANALYSIS OF ACTUAL DISASTER MANAGEMENT PROCESS*

by Chao ZHANG**, Norio OKADA*** and Yoko MATSUDA****

1. Introduction

Risk communication takes an important role in the risk management of natural disaster. According to the National Research Council in the United States, it is defined as an interactive process of exchange of information and opinion among individuals, groups, and institutions[1]. This is a general definition. During the different phase of the actual disaster management cycle, its concrete appearance will be via various patterns, depending on different situations, especially for different time and stakeholders. In this paper, through the case study of Typhoon No.23, happened in Japan in the autumn of 2004[2], especially from the early-warning and preparedness issues concerned, three types of risk communication patterns are discerned.

2. The various risk communication patterns

(1) The information process within one agent

Risk communication concerns at least two agents. Within each agent the information process can be described by the CED model[3], as shown in Figure 1: The agent receives information from the source of information and through the process of cognition, evaluation and direction, and then sends this direction to another agent. Here the information sink of this agent would be the information source of another agent. In the cognition process the agent needs to recognize the fact; and in the evaluation process the agent need to conduct the value judgment; and in the process of direction process, the agent makes a corresponding decision.

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** COE researcher, DRS, Disaster Prevention Research Institute, Kyoto University,
(Gokasho, Uji, Kyoto 611-0011, Japan, TEL 0774-38-4038, FAX 0774-38-4636, zhang@drs.dpri.kyoto-u.ac.jp)

***Member of JSCE, Dr. Eng., Professor, DRS, Disaster Prevention Research Institute, Kyoto University,
(Gokasho, Uji, Kyoto 611-0011, Japan, TEL 0774-38-4035, FAX 0774-38-4636, n_okada@drs.dpri.kyoto-u.ac.jp)

**** Student member of JSCE, Graduate School of Urban Management Engineering, Kyoto University,
(Gokasho, Uji, Kyoto 611-0011, Japan, TEL 0774-38-4038, FAX 0774-38-4636, matsuda@drs.dpri.kyoto-u.ac.jp)

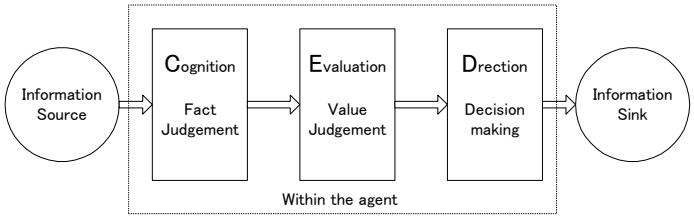

Figure 1: CED information process model

(2) Three types of risk communication patterns

As the actual risk communication process concerned, we need not only do to consider the various spatial, temporal factors, but also the characteristics of agents. Under this consideration the following three types of risk communication patterns can be discerned and generalized as the corresponding risk communication models.

1) Upstream-Downstream River Basin Model

In this case the information flow is one-way, also the information was made deliberately, that means the sender exactly knows to which agent the messages are being sent. In the case of Typhoon No.23, during the period of early-warning, the dissemination of various early-warning messages from the meteorology agencies and river agencies to the local office. And the corresponding recommendatory and mandatory evacuation messages were issued to the residents by the local offices. These can be grouped as this type of risk communication.

This kind of risk communication has its own shortcoming. As Figure 2 shows, the agents A and B (here they would be the meteorology and river agencies) in the upstream sends messages (such as send FAX) to agent C (it could be the local office). Because the flow of information is one direction, though the agents in the upstream knows which is the information target, but they do not know if the message has arrived at the target agent or if the target agent completely understood the meanings of information. So sometimes the following circumstance will happen: Agent C receives a large number of FAX sheets from the upstream agent, this will make them confused. This indeed happened in the period of Typhoon No.23 disaster last year. To solve this kind of problem, the agents downstream need a “pump-up” to give necessary information, i.e. some feedback, to the agents in the upstream.

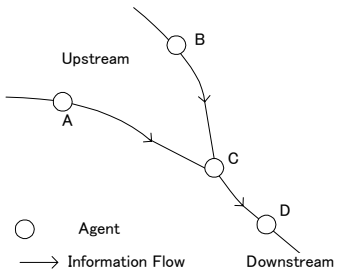

Figure 2: Upstream-Downstream River Basin Model

2) Lake Basin Model

In this circumstance, as the figure 3 shows, Agent C collects the necessary information from an

“information Lake” which was formed through the information sharing among different agents. And then through its own CED risk communication process, the agent C makes the corresponding decision or action. In the period of Typhoon No.23 disaster one sightseeing bus was isolated in Yura River. The followed risk communication in the whole rescue process can be discerned to belong to this type of lake basin model. Here when the rescue team (can be seen as agent C) conduct the operation, they must have the necessary information shared by the sectors such river (A) and highway (B) managements. Here there is one point which is different from Up-down stream model, it is that agent C actively collect the information it needs and does not received the information from the agent A and B passively.

3) Parallel Model

The above mentioned patterns are discerned mainly from considering agents and spatial factors. The flow of information is basic irreversible to time and do not need to be repeated. During the period of disaster preparedness, there exist some circumstances which the risk communication is repeatable. “Be repeatable” here means it can be done again from the beginning. The risk communication conducted in the community based disaster preparedness can be seen to belong to this kind of pattern. In this process the residents and experts from NGOs or research institutes are involved. The former have the local knowledge, and the latter have the community risk analysis experience and capability, but do not know about this specific community. Though bi-direction and interactive risk communication, some implicit knowledge hidden within one agent will be developed to explicit knowledge used for the community based disaster preparedness[4)]. This kind of participatory and interactive risk communication can be depicted by the parallel model, which as Figure 4 showed. Here “A” represent experts outside, and “B” represent local people. The information flow is repeatable. And of cause this process will not last for ever, and will stop until certain special time such as the disaster happen. In the Typhoon No.23 disaster, the problem related with temporary shelters setup were found very server. Some temporary shelters which maybe are useful in the earthquake are found useless during flood disaster. Of course the solution of this kind of issues must be related with the involvements of local people. And the corresponding knowledge can be acquired through the participatory risk communication during the period of disaster preparedness.

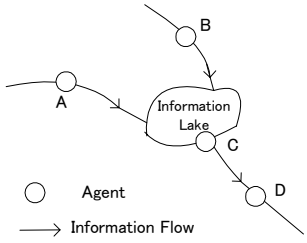

Figure 3: The Lake Basin Model

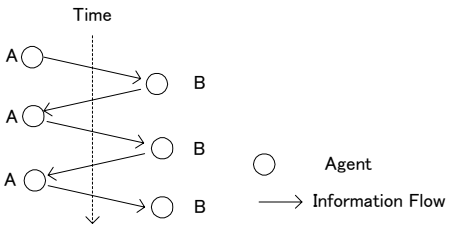

Figure 4: The parallel Model

3. Discussion and Conclusion

The risk communication will have different patterns in the different phase of disaster management cycle. For the above mentioned three types of model their characteristics are given in the figure 5 from considering the role different agents plays and the information concerned in the risk communication. To find these difference will not only help us better understand the risk management from the integrated viewpoint, but also benefit for the design of effective operational information system for disaster management.

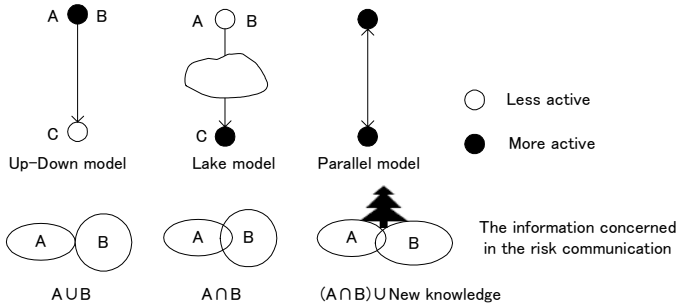

Figure 5: The characteristics of different model

In addition, commonly speaking the residents are the end victims of natural disaster. Their capability of risk perception to natural disaster should be improved under the help of government and NGOs. The related risk communication between them are two-direction and repeatable. But this kind of "repeatable" should not be thought to last forever. In the normal time the residents, governments and NGOs should hurry up and work together, strengthen this kind of risk communication. Otherwise, once a disaster comes, one-direction risk communication will not effective.

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