

## **Studies of Emergency Management Procedures in Greece, Italy and the United Kingdom**

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### **Abstract**

Natural phenomena are planetary actions, which may cause disastrous results to the human life, property and environment. Nowadays the number of losses caused by natural catastrophes has been increased. As humans are not capable of avoiding nature, they need to prepare and plan in advance their actions in response to these events. On this basis, various emergency management bodies involving authorities on a local, national and international level have been formed to mitigate, prepare, respond to and recover from catastrophes. They act under the label of Civil Protection (CP) for the member states of the European Union. This paper presents the ways of communication between CP members in Greece, Italy and United Kingdom (UK). The current information and communication technologies (ICT) used during an emergency are assessed based on interviews with expert representatives of CP organisations for each country. Finally, through the use of soft systems methodology (SSM) the limitations of current approaches are outlined.

### **Keywords**

Civil Protection, Emergency Management, ICT, Natural Catastrophes

## **1. Introduction**

Research studies over the last fifty years suggest that the number of losses caused by natural catastrophes is becoming increasingly significant. It is not only that the public is growing ever more aware of natural

disasters due to increased general knowledge and the expansion of mass media, but also that the number of natural catastrophes is constantly increasing (Burton et al, 1978, Bryant, 1991, Lekkas, 2000). Some of the factors responsible for this development include the increase in the world's population and the density of population within an area and the emergence of settlement in areas that were previously uninhabited. Data extracted from research work of Shaw et al (2003), Gupta (2003), Lekkas (2000), Shah (1983) and others demonstrate the increase in the number of deaths between the periods of 1947-1981 and 1982-2000. On average, natural disasters cause 184 deaths per day (europaworld, 2004). In addition to this, the world recently experienced the results from the Asian tsunami. Apart from human losses, natural catastrophes cause damage to buildings, the general infrastructure of an area, and the normal activities associated with everyday life. The damage caused is usually translated into monetary terms. Therefore, cost is considered to be another important issue related to the occurrence of natural catastrophes.

Overall, it is evident that there is an increase in relation to the natural catastrophes and human life loss, which together add to the losses in the socio-economic system. Therefore, human organised societies trying to prevent, organise, analyse, plan, make decisions, and finally assign available resources to mitigate, prepare for, respond to, and recover from all effects of all catastrophes (Trim 2003, Shaw et al 2004). These are the steps of a professional discipline called emergency management that has been established to save lives, prevent injuries, and protect property and the environment if an emergency occurs through the set of a range of measures to manage risks to communities and the environment (EMA, 2002). Considerable research is currently being conducted in the area of emergency management to improve the ways that catastrophes are managed.

## **2. Civil Protection in the European Union**

Although the actions that people take in order to cope with disasters take place after the natural catastrophe occurs, these actions have to be organised and planned in advance. Planning includes the set of activities necessary to analyse and document the possibility of a natural phenomenon to cause an emergency, or catastrophic situation and the potential consequences or impact on life, property and the environment. Therefore, each country has formed bodies responsible for coping with disasters. These bodies are known as Civil Defense for the United States and Civil Protection (CP) for the member states of the European Union (EU). CP acts as a coordinator when international relief units are needed. During these situations CP ensures that the appropriate personnel are dispatched to the disaster area as quickly as possible. It also acts as a guide for the member states in order to create and improve their own emergency plans. Each country follows a series of 'planning principles', which have been developed by the CP and serve as general guidelines for the creation and improvement of emergency planning. This study is concerned with the effectiveness and efficiency of the communication methods of CP with the other authorities involved towards the successful completion of the response to a natural catastrophe. As all member states of the EU act under the same 'planning principles', this study focuses on a limited sample of three EU countries. These are Greece, Italy and the United Kingdom (UK).

## **3. Operational Procedures in Greece, Italy and UK**

The three countries under examination have not experienced the same kind and range of natural catastrophes. For example, in Greece and Italy serious volcanic eruptions have occurred in the past and the Etna mountain in Italy is still active. In addition to this, in both countries there is continuous seismic activity, which some times are of concern to scientists. It has also caused catastrophic results for the population in the past. In contrast with the above, the UK has not experienced any seismic activity or volcanic eruptions because of its geological conditions and its geographical position. There are concerns about other natural

phenomena, such as tsunamis, floods, strong winds and heavy rains. These are categorised as weather-based hazards and their advantage is that science can prevent them most of the times and they are not sudden. The prevention of a catastrophic event makes the response easier, as the relevant parties have the time to prepare their actions and potential victims have time to protect themselves. This is the main difference between the UK and the other two countries. As Greece and Italy are usually affected by geological catastrophes, which do not provide response teams with the necessary lead time for preparation, there was need for a different approach to their response. In order to establish emergency response procedures a series of interviews were conducted with leading members of the CP bodies of the three countries. The purpose of the interviews was to find out the authorities involved, the hierarchy between them in the immediate response to a natural catastrophe and the ways the members of these authorities communicate during the response operation. The effectiveness and the efficiency of the ICT in use were also been critically examined. The next paragraph presents the findings.

The authorities involved in the response to a natural catastrophe include the CP, the Police Department, the Health Services, the Fire Department and in highly demanding situations, the area's Armed Forces. CP is acting as the operational leader in Greece and Italy, while Police is the leading body for the UK. These authorities try to work as teams along with other non-profitable organisations, such as humanitarian bodies, volunteers and charities. The means of communication between them consist of telephones, mobile phones, fax, satellites, and VHF radios. Fundamental to emergency planning is the identification of the demands that characterise the disaster response environment and developing the management capabilities required to deal with them (Paton and Jackson 2002). In order for the demands to be identified, there is the need for the exact picture of the reality. However, the first images from the affected area reach the operation centre through the TV channels' breaking news, or through the oral description that the victims provide to the emergency services asking for help. The official information about the magnitude of the phenomenon, its nature, the location affected, the development of dynamics, and the impact of the event come from the relevant bodies within the first half an hour. As an example during the occurrence of an earthquake, the National Observation Centre (NOC) in Greece needs 25 minutes in order to collect, analyse and assess relevant data and provide, using a FAX message, the CP with exact information about the phenomenon. Although the information provided describes the phenomenon according to standard parameters they are not in a form that would enable someone to understand the scale of the catastrophe. Thus, the NOC informs the CP that an earthquake with a magnitude of  $x$  degrees on the Richter scale has occurred in a particular area, but no one knows if there are any deaths, damaged structures or other catastrophes. In order for detailed information to become available and for the CP along with the other authorities involved to be in a position to organise all the stages of the response operation, the local authorities of the area where the event occurred have to be contacted. They provide information about the situation in the area using the existing landlines and mobile telephone networks, the satellite telephones, and the special networks for wireless communication used by the mobile units of the Police and Fire Brigade. The collected information is stored and assessed in the LANs and WANs of the CP and according to the decisions taken by the leaders of the authorities involved the operational units get informed about their next steps and the resources available. At the same time, the remote units provide feedback to the operation centre. Figure 1 highlights the stages of operation and the involvement of the relevant participants.

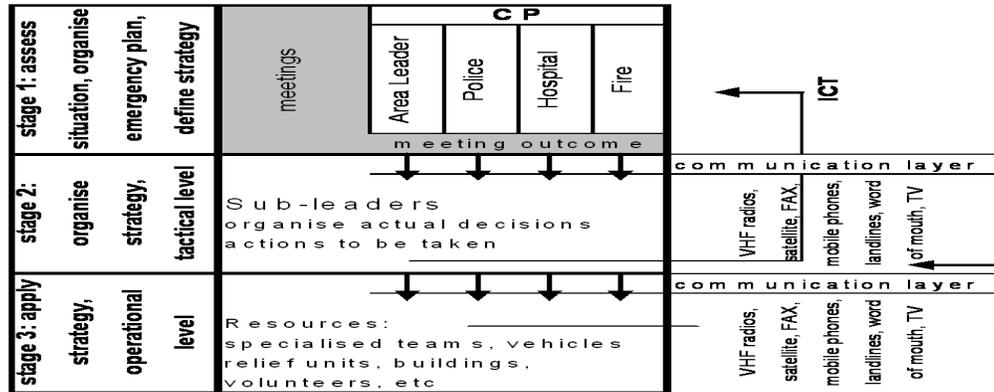


Figure 1: Operational Procedures

#### 4. Soft Systems Methodology

For the processes during the operation to be understood, the problematic situations need to be identified and suggestions for improvement to be made. Soft Systems Methodology (SSM) is used as a methodology that aims to bring about improvement in areas of social concern (von Bulow's, 1989, Checkland & Scholes, 1999), as other conventional methodologies have failed to deliver what is required (Lucas, 1975, Mingers, 1995). They usually deal with well-defined problems in real world situations (Horton, 1999). Galliers (1987) points out that they lack mechanisms or techniques for identifying users key information requirements, as they assume that existing systems are effective or that users' know what they want and their requirements are straightforward to a technical solution. He also argues that these methods pay less attention to the human aspects compared to the technical aspects.

In contrast to hard systems, SSM constructs conceptual models of systems and uses them as tools for investigating the real world (Horton, 1999). It enables someone to view a collection of interrelated items as an ordered arrangement which, as a whole, achieves some purpose (Patching, 1995). As opposed to hard systems, SSM addresses complex, badly structured problem situations. It is concerned with investigating a problematic situation that is not well defined. Many authors including Checkland and Scholes (1999), Bessis (2003) and, Cushman and Venters (2004) have used SSM to appreciate human interaction as an interrelated item within an activity system. Therefore, it is believed that SSM can be applied to the research problem of the presents study. The reasons are as follows:

- The nature of identifying how emergency response decisions and orders could be communicated more effectively and efficiently between relief units.
- This research is concerned with a messy situation, therefore it would not be handle with a straightforward, linear and organised solution.
- The present research does not aim to focus only on the technological aspects as it is concerned with the human aspects as well.

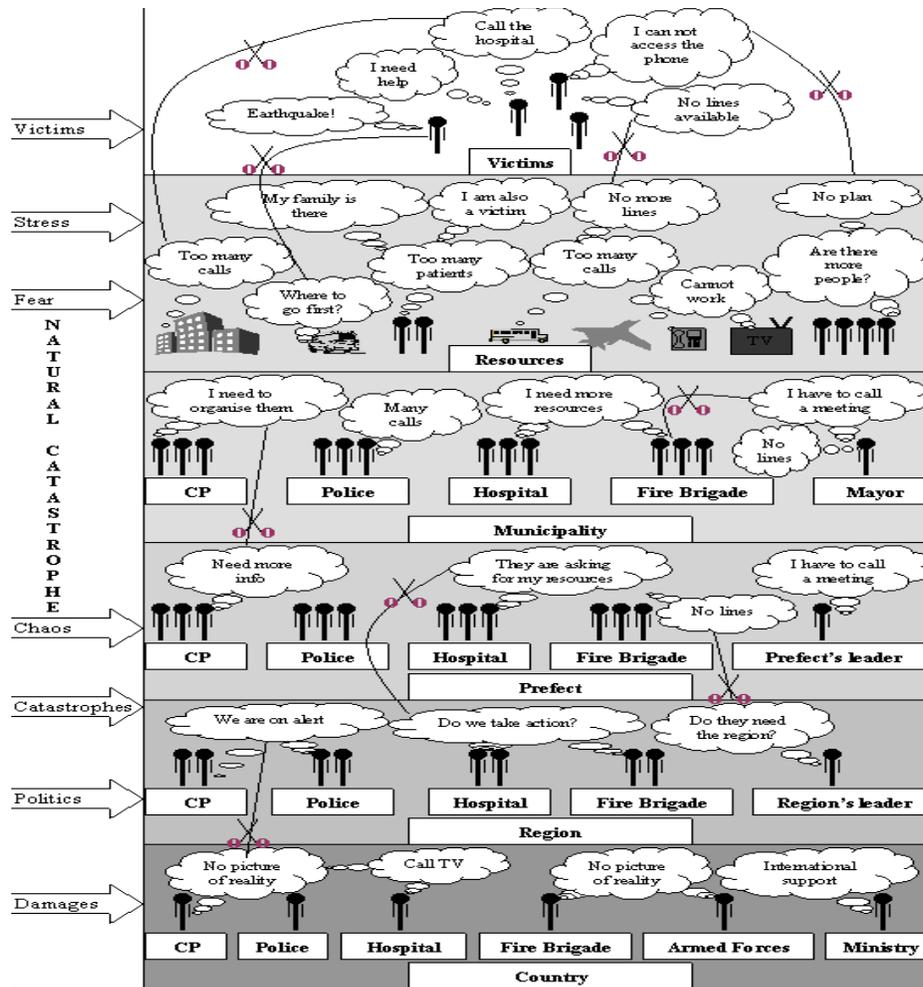
##### 4.1 The Rich Picture

Rich pictures is a technique which has been used to explore the communication and comprehension of the problem situation. Checkland and Scholes (1999) stated that their rationale lies in the fact that the complexity of human affairs is always a complexity of multiple interacting relationships and pictures are a better mediums than linear prose for expressing relationships.

The following rich picture (Figure 2) is a representation of the problems and conflicts, which occur during the response operation to a natural catastrophe. It demonstrates that participants of the process are within a messy situation as they are required to act under stress and organise themselves in a dynamically changing environment. It also illustrates that the more participants required the more complex the situation as it may involve coordination of resources from higher hierarchical levels.

### 5. Conclusions and further work

Natural phenomena may cause disastrous results to the human life, property and the environment. As humans are not capable to avoid nature there is the need to get prepared and plan in advance in order to be able to control and coordinate their actions in response to these events in the most safe approach. Findings from this study suggest that although the bodies responsible for the response to natural catastrophes are making a serious effort to the preparation and operational stages, they act within a complex, messy and dynamically changing environment. It is important for them to see the picture as a whole in order to assess it and communicate their decisions and orders in a far more effective and efficient manner. The next steps of the study is to further apply SSM to identify the potential of Grid technologies for a conceptual model, that will monitor, plan, control and manage actions within an emergency situation caused by natural catastrophes.



## Figure 2: Rich Picture

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