Joint-Task Force Management in Cross-Border Emergency Response. Managerial Roles and Structuring Mechanisms in High Complexity-High Volatility Environments

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ABSTRACT: In this paper we focus on managerial roles and structuring mechanisms within the crisis preparedness system. We elaborate on the challenges of crises management in complex and volatile environments. The coordination and control mechanisms are of importance to safeguard operations including joint operations including several preparedness institutions, especially in cross-border cooperation. We include examples from the maritime Arctic. This paper contributes to the crisis management literature emphasizing the relations between context, managerial roles and the organizational structuring mechanisms needed to facilitate the interplay between several emergency response actors.

1 INTRODUCTION

Crisis management often takes place in challenging contexts. A crisis situation is also often characterized by the need for a broad range of efforts, and at the same time resource scarcity. Thus, we often are in need of capacities from different institutions and even cross-border support. As an example, incidents at sea are challenging compared with land-located incidents due to remoteness, lack of resources and nature. Help from a broad range of actors and countries may be necessary. It is a crucial task to be able to integrate multiple actors into a functioning emergency response system (Sydnes & Sydnes, 2011). Composite crises may include search and rescue (SAR), oil spill recovery, fire fighting, salvage, and actions violent behavior such as terror. To cope with such emergencies, there is a need for a broad range of capabilities from multiple actors and across many jurisdictions (Comfort & Kapucu, 2006).

The crisis management tasks become more difficult in environments characterized as highly complex and volatile (Hossain & Uddin, 2012; Bigley & Roberts, 2001). Dealing with maritime crises in this context increases the need for interaction between actors from several preparedness institutions.

A complicating variable related to the emergency operations is the presence of different formal and informal institutions (Van de Ven & Walker, 1984), as well as cultural differences and a lack of trust between different parts of the preparedness system (Kapucu, 2005; Axelrod & Cohen, 1999; Borch & Arthur, 1995). Increased environmental volatility may also call for dynamic capabilities in the command structure for improvisation and fast reorganization of the available resources (Borch & Batalden, 2014; Turoff et al., 2012). In a traditional hierarchical command structure that we find within the preparedness institutions the need for flexibility, improvisation and fast reorganization may be hampered by "silo thinking" and rigid formal structures (Bigley & Roberts, 2001).

So far, we have few studies emphasizing the contextual influence on emergency management and preparedness system coordination (e.g. Larsson & Hyllengren, 2013; Buck et al., 2006). In particular, we lack studies emphasizing the relations between managerial roles, capabilities needed and the role of structuring mechanisms in joint, cross-institutional operations (Hossain & Uddin, 2012; Turoff et al., 2004).

To increase both effectiveness and efficiency within the preparedness system, we are in need of managerial concepts and command structures for optimal exploitation of joint resources. In this paper, we elaborate on the managerial challenges of coordination and control in composite emergency operations. We take into consideration the contextual challenges facing the command system in high volatility, complex environments, and how this context may influence on the managerial roles and structuring of the preparedness system.

This paper is organized as follows: First, we present relevant theory about managerial roles and mechanisms of coordination and control. We emphasize the interorganizational coordination and the importance of contextual variables. Then, the paper proceeds with presenting the context of the High North as a case illuminating a complex, volatile environment. Next, the case of a standard emergency management model Incident Command System (ICS) is discussed. This standardized emergency management system is implemented in several emergency organizations in a number of countries. The ICS is used as an example in the discussion on how the range of roles and structuring mechanisms may differ in context in contrast to a "one type fits all" approach. In the conclusion chapter, we draw attention to the special managerial demands of joint actions that may include cross-border cooperation. We discuss the implications for future research in this area.

2 THEORY

Within organizations, a broad range of managerial roles has to be matched by adequate coordination and control mechanisms to achieve an effective interplay (Bigley & Roberts, 2001). Organizations dealing with crisis often have to cooperate closely with other preparedness institutions. For such cooperation, bridging mechanisms to match two or more organizations with different managerial systems have to be defined. Due to the character of a crisis, this coordination has to run smoothly from the start and at a very high pace (Comfort & Kapucu, 2006). This calls for both roles and structuring mechanisms being adapted to different settings.

2.1 *Managerial roles*

Emergency management is characterized by a strict interplay between the operational levels from the headquarter down to the on-scene incident command structure close to the incident site. This implies focus on roles and capabilities at both strategic, operational and tactical level. Uncertainties and conflicts over the roles in a between the layers may negatively influence on managers' performance. In complex environments, a large number of aspects towards a broader range of stakeholders have to be considered (Mintzberg, 2009).

Managerial role is a set of actions and responsibilities that are assigned for each of them. Mintzberg (1973) claims that managerial roles within an organization can be classified into three main groups: interpersonal, decisional and informational.

Interpersonal roles include the figurehead, leader, and liaison roles. They arise directly from formal authority and involve basic interpersonal relationships. The figurehead role involves both internal motivation and inspiration, and representing the crisis organization externally towards different stakeholders, for example media, interest groups and next of kin; the leader role constitutes leadership duties towards subordinates and the duty to have overall responsibility for the unit. Contact and coordination outside the vertical chain of command are referred to as the liaison role.

Informational roles include the monitor, disseminator, and spokesman roles. By means of interpersonal contacts these roles are central in an organizational unit. Managers constantly scan the environment for information, pass information further to subordinates and some information to people outside the unit. Constant information flow is critical to be able to allocate resources and achieve efficient mitigating actions with lowest possible risk to the personnel.

Decisional roles include the entrepreneurial action, disturbance handling, resource allocation, and negotiator roles. Information is the basic input for managers to decision making. In the entrepreneurial role, managers seek to improve the unit by adapting it to changing conditions in the environment. They also respond to different pressures and handle ad hoc problems. Improvisation finding new create solutions may be important in the very turbulent situation of a major crisis. In the resource allocator role, managers are responsible for decisions and strategy for resource distribution. To achieve the necessary resources and results, negotiations are important. Gaining control over and acquiring costly resources from other institutions and other countries may be challenging. Negotiations may be seen as an integral task.

Fast decisions may be of special importance to meet dynamism in the environment. In stable organizations, formal duties descriptions may contribute to harmonized action. However, in a crisis organization, the defined standard operating procedures that have functioned well in the past may not be appropriate (Rosenthal et al., 2001). Thus, in organizations facing volatile environments, there is a need for innovation and entrepreneurial, dynamic capabilities related to specific persons or integrated into the present roles (Borch & Madsen, 2007). The operational and tactical management may have to improvise and work on reconfiguration, including new action pattern, repositioning of resources and uplinking to other roles and processes. This means that the discussion on the contents of the managerial roles has to be linked up to the coordination and structuring mechanisms.

2.2 *The joint coordination and structuring mechanisms*

Coordinating and controlling are essential mechanisms in organizations (Mintzberg, 2009). In general, structuring mechanisms represent a set of procedures for assembling and reassembling various organizational elements into a variety of configurations (Bigley & Roberts, 2001, p.1287). In crisis situations, the traditional control structures may be superseded by the coordinating mechanisms (Hales, 2002). The coordination of tasks refers to a systematic relationship between decisions about resources and processes in order to achieve the desired outcomes (Alexander, 1995; Haas, 1992; Auf der Heide, 1989).

In emergency response systems, these coordination tasks involve institutions with various organizational design. The joint emergency operations may include police and armed forces, coastal guard and rescue coordination centers, fire and rescue services, helicopters and ambulance, other public authorities and private actors. In some emergency systems, voluntary organizations are particular useful on-scene because they can provide great numbers of well-trained people who are familiar with the local areas. The cooperating institutions may have implemented different organizational structures, routines, management roles and control mechanisms. Therefore, achieving coordination between them becomes challenging.

In emergency situation, the speed of adapting to a specific organizational structure is, however, crucial. Organizations need to address these challenges and ensure an effective interplay. As organizations vary, their organizational structure should be flexible and capable of linking up to each other through employing structuring mechanisms such as interdepartmental liaisons, joint procedure sets and multi-functional task forces (Alexander, 1995).

The emergency response systems found include some standard coordination mechanisms. According to Bigley and Roberts (2001) structuring mechanisms consist of at least four basic processes; structure elaboration, role switching, authority migrating, and system resetting. The **structure elaboration** process is initial and important because management should be organized on-scene under demanding circumstances. **Role switching** is the process of assignment and reassignment of personnel to different positions in accordance of the functional requirements of the situation. **Authority migration** happens when critical expertise or capacity in a certain emergency area can be de-coupled from the official hierarchy and moved to another authority when needed. **System resetting** is another process to match changes in working conditions through making the organization look through the structure, competence and routines in the light of the new scene of operation.

2.3 *The importance of context*

A central assumption in organization theory is that organizations exist in their social and environmental context, and are influenced by it (Bigley & Roberts, 2001). From this perspective, contextual factors influence the firm performance and organizational outcomes. As suggested by Hansen and Wernerfelt (1989), the contextual variables include factors like sociological, political, economic and technological conditions; and human resource factors.

Roles and structuring mechanisms are difficult to configure in large disasters, which often involve multiple hazard, with a range of agent-generated demands, multiple responding agencies, and conflicting goals that cannot be anticipated and reconciled. Coordinative mechanisms depend on complexity of disaster response, recovery and mitigation tasks (Buck et al., 2006). The term complexity have been traditionally associated with a description of the working environment of an organization, and in broader systems also with external environment like weather conditions, ecologies, information networks, and number of stakeholders (Dooley, 2004). Complexity characteristic illustrates the range of factors and dependency relations among the involved actors within the business processes of an organization (Borch & Batalden, 2014). Managerial challenges are linked to the coordination and control of a broad range of physical, cultural or institutional elements in the environment.

Volatile or turbulent environments are characterized by lack of understanding of the cause-effect relations making decision-making a challenging task. Volatility is instability and lack of predictability that will aggravate the uncertainty of outcomes (Borch & Batalden, 2014). Extreme events are regarded as volatile because of rapid changes and unpredictable outcomes (Turoff et al., 2012).

As for resources, the emergency situations are often characterized with limited physical resources as well as competent personnel in and around the organization. This calls for extra links to more institutions. This increases complexity and uncertainty about how these external resources can be integrated into the emergency organization.

The environment may vary between stable and volatile characteristics, and simple or complex. In low complexity and stable environments, the number of external links may be low and management may concentrate on the intra-organizational roles, and coordinate through hierarchical structures and functional specialization. High volatility and complex organizations call for a broader set of roles and more sophisticated coordination mechanisms.

3 THE CASE OF THE ARCTIC AND THE INCIDENT COMMAND SYSTEM

As shown above different contexts may influence the managerial roles and the included coordination mechanism. We illuminate these challenges through a discussion on the roles and structuring mechanisms of the standardized incident command system (ICS). This system that originated from the US fire brigades is now implemented in several national preparedness organizations worldwide.

3.1 *The Operational context of the High North*

The operational environment of the High North is characterized as both complex and volatile (Borch & Batalden, 2014). In the High North the volatility parameter refers to the difficulties the actor face on predicting nature, and the functionality of resources available, among others due to different cultures, political interests and training.

Another crucial characteristic of the High North which can influence operational environment is the scarcity of resources. Generally, this term refers to the lack of critical resources for survival and growth. In emergency systems, they are capabilities that are needed for response to mitigate the crisis situation. The resource challenges are present both related to equipment, personnel and organizations (Comfort & Kapucu, 2001).

The increased activity in the High North increases the vulnerability related to human safety, environment, physical installations and vessels. The High North is defined as the geographical regions north of the Polar Circle where maritime operations are challenged by long physical distances to civilization, limited harbor infrastructure, low temperatures with ice and icing, polar lows, and vulnerable nature. This calls for extra competence and capabilities for all activity in this region. Earlier studies have increased our understanding on the effects of increased complexity in offshore commercial operations (Gudmestad et al., 1999; Thunem, 2010). Increased knowledge on adequate operational concepts in the Arctic is in demand. In its whitebook “An Innovative and Sustainable Norway” the Norwegian Government states that the main objective now is “to secure an active Norwegian presence in the North and to exploit the resources and transport opportunities in the region”. Thus, the maritime industry in the North represents an area of commitment. This ambition calls for a new knowledge about how to increase safety and facilitate effective and efficient exploitation of commercial opportunities in the region.

In addition, the political sensitivity is present as this is a region with shared responsibility between US, Canada, Denmark, Finland, Sweden, Iceland, Norway and Northern Russia. These Arctic states are members of an intergovernmental forum, the Arctic Council. All cooperation, coordination and interaction among the Arctic states are handled through the Arctic Council with participation of other non-governmental associations and non-arctic states observers. The Arctic states are committed to several bilateral and multilateral agreements in relation to certain emergency preparedness activities. The question of emergency preparedness in the High North has a primary focus on search and rescue operations, and on preparedness for pollution caused by extensive maritime activities from shipping, fisheries, offshore petroleum installations and maritime tourism.

Search and rescue operations in the High North are since May 2011 governed by the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic. This is the first and the only one legally binding treaty signed under the auspices of the Arctic Council so far. The responsibility is expanded between all the eight Arctic states. Oil spill response responsibility in the High North is coordinated by the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic since 2013. The United Nations Convention on the Law of the Sea (UNCLOS) is the international treaty created at the third United Nations Conference on the Law of the Sea. These international agreements demonstrate the commitment for joint coordination of emergency response in the Arctic. It is important for all Arctic countries to involve relevant preparedness institutions in the north in the process and to inform them about all conditions of the agreements aiming at coherent coordination.

Unfortunately, climate change and its unpredictable consequences make emergency response in the region complicated. We still lack knowledge on how these composite contextual elements may influence the operational interaction between the institutions within the preparedness system. Resources for providing effective emergency response in the Arctic are limited (Arctic Council, 2009). Oil spill recovery techniques suffer from reduced functionality under severe Arctic environment. There is limited police authority present to deal with violent action. Having limited resources countries depend on each other’s assistance. Cooperation of all the personnel resources and units available is a key to success.

A major part of the mobilized forces will be the ships, helicopters and equipment hired by the commercial actors such as the shipping industry and oil companies. Advanced and tailor-made technology is needed to deal with environmental challenges. Understanding the technology and competences for utilizing complex preparedness tools are of critical importance in the High North (Borch & Solesvik, 2013). The units present may

have a multi-functional design including safety and security functions.

To sum up, the Arctic context represent a high complexity and volatile environment, where resources available for the emergency response units are scarce. This may imply a broad set of adapted managerial roles and a need for structuring mechanisms facilitating operation in a high complexity-high volatility context.

3.2 *Incident command system*

Deciding upon the managerial roles and finding the adequate organization of emergency response units is a challenging task. Institutions within the preparedness system have implemented a broad range of standard functions and roles as well as structural configurations to deal with critical incidents. In several countries like Norway, we find that these systems vary across institutions. In Norway, the police with the overall coordinating role has a different organizational structure and positions than the other emergency institutions like the fire brigade and paramedic systems.

The Incident Command System (ICS) is an emergency management tool which includes specific roles and facilitates coordination and control of personnel and equipment at incidents of any types. Originally, the ICS was created for fire departments fighting wildland fires in California in the 70ies. Since then, the ICS approach has turned out to be suitable for a wide range of emergencies, such as fires, hazardous materials spills recovery, and multi-casuality accidents of nearly any size (Bigley & Roberts, 2001; Lindell et al., 2005; Buck et al., 2006). The ICS includes a standard management hierarchy and managing procedures.

In general, the ICS is constructed around five major roles: command, planning, operations, logistics and finance/administration (Lindell et al., 2005). These blocks are supposed to be applied to situations of all sizes. The basic ICS includes a set of rules and practices to guide the actions, standardized job descriptions with a training program for each positions, common terms for equipment and supplies, a structured chain of command from the specialist on the ground to the incident commander, authority commensurate with responsibility and task assignments, span of control limited to the number of people that one person can effectively control, and sectoring of work to ensure efficiency, effectiveness and safety. (Buck et al., 2006).

4 DISCUSSION

Even though some emergency management system like the ICS has been widely implemented, Buck et al. (2006) highlight the importance of context as a largely un-examined precondition to an effective management system. Bigley & Roberts (2001) call for testing the emergency management models in diverse contexts. When a broad range and different types of institutions are involved, we need to analyze the effects carefully. Not the least, the interplay between very different types of organizations like the military forces, professional emergency institutions, private companies like the ship owners and volunteer organizations may function differently in extreme environments like the Arctic.

4.1 *The Arctic context and managerial roles*

Operating in the Arctic means that the management has to take into consideration a number of bilateral and multilateral treaties that address different spaces and types of activities. An example is the emerging Polar Code legislation launched by the UN International Maritime Organization introducing strict demands as to vessel configuration as well as competence of the crew. This calls for extra decisional and informational roles.

Within emergency management, there is a need for the additional roles like disturbance handler and negotiator. For some areas, there are disputes over territorial rights, and the region is political sensitive with a lot of military activity taking place. This calls for *additional decisional roles dealing with security and political issues*. There is a need for strong top down communication between top government and operational level to check out acceptable solutions in sensitive areas. In some operational fields like SAR and oil spill recovery there are quite clear agreements on responsibility and host nation support. However, these agreements might not be valid or provide fast enough action when it comes to implementing them through resource acquisition. One example is the sanctions introduced in 2014 against Russia during the Ukrainian crisis.

A high degree of isolation and turbulence especially in winter months in the High North creates difficulties in gaining enough professional capacities. This calls for attracting more volunteers and others with limited training. It means that the recruitment and the educational actions may be of extra significance. The Norwegian Directorate for Civil Protection claims that there is even stronger need for training when the actors have to interact with foreign resources (DSB, 2013). Therefore, the *informational duties integrated into logistics roles* are of special importance in the emergency management system.

There will also be different and conflicting interests in this region. In major international emergencies, every action taken is highly visible. This means an extra focus on the commander's responsibility for the overall operation and *the status of formal authority*.

People coming from different cultures and language groups may have problems understanding each other as well as trusting each other. This calls for additional *cross-cultural liaison roles,* and *the role of rewriting of procedures*. As an example, during the evacuation of the Maxim Gorkiy cruise ship after collision with ice at Svalbard, the Norwegian coast guard as on-scene commander was not able to communicate with Russian military and civilian helicopters and airplanes due to language problems and lack of joint procedures (Hovden, 2012). Such an operational context influences the initial condition of the ICS system and impedes the implementation of the pre-established standardized procedures.

4.2 *The High North context and the structuring mechanisms*

The complexity of the High North is caused by a large number of stakeholders and the range of natural factors that have to be considered in operations. There are climate challenge with extreme weather, and the need for inclusion a broad range of government institutions. Another complicating factor relates to the fact that responsibilities and interests in rescue operations and surveillance are divided between many separate national institutions. In Norway, a grounding or a fire-fighting operation at sea may involve 10-12 government institutions at local, regional and national level. This calls for extraordinary competence and capabilities for co-ordination and overall governance of the maritime activity. Structuring mechanisms such as *joint authority tools, horizontal staff interaction, frequent multi-level communication, delegated authority and adapted operational procedures* and *standard high tech communication tools* may contribute to solve the coordination challenges.

Volatility is characterized by the lack of understanding of the cause-effect relations during emergency operations. Consequently, the established standard operating procedures may only partly fit the situation (Christensen & Johannessen, 2005; Stacey, 2001). There will never be one task that fits a certain emergency. Turbulence is especially crucial when analyzing the tactical level challenges. The dynamic capabilities related to *acquiring for new resources, teaming old and new resources* and *finding new solutions* in high ambiguity settings are crucial.

To sum up, there is a constant need for on-scene structure elaboration, because of high complexity and volatility, and for readiness for role switching because of the resource scarcity. Authority migrating can be of need because the High North is a multi-actor political arena, so the system should be ready for resetting.

4.3 *Managerial roles and structural mechanisms in a high complex and volatile environment*

The incident commanders of emergency organizations have to fill several roles to deal with the crisis situation. Within crisis management there are duties related to (Turoff et al., 2004):

- mapping human and equipment resources
- intelligence
- reports and updates the situation,
- operational coordination,
- maintaining or acquiring new resources
- advice and information
- redesign of roles and responsibilities
- setting priority and new strategy

The crisis management system and especially the incident commander roles have to be scrutinized to secure system effectiveness in different contexts.

In a crisis situation it is never certain who will take on which role or a combination of roles. In some emergencies, persons who are qualified for one type of actions may be assigned for other roles. Bigley & Roberts (2001) state that the system in use must be able to expand and contract, change strategic orientation, modify or switch tactics as an incident unfolds. In volatile environments, there may be incidents that are totally new to the commanders. Buck et al (2006) point out that the main concern of today's debates in literature focuses on inter-organizational coordination mechanisms. The critics claim that standardized systems fail to recognize all transformations of the structure and functions of the established organizations during response phase. In practice, this means that the system includes separate units using different command approaches, and even unexperienced actors like volunteer organizations. This coordination problem coupled with the complexities of the organizational environment creates the need for establishing new adapted coordination and control mechanisms.

Studies of the ICS concept have shown that they are most successful in stable, low complexity environments with a common government structure, with pre-established protocols for interorganizational development in times of crisis and when there is a significant interagency pre-training of command staff (Buck et al, 2006). The adjusted coordination approaches for multi-task response is required. Buck et al. (2006) emphasize the following coordinative mechanisms including shared knowledge and technical aspects, a shared vision of response while working problems together, a high level of trust in one another; a trained response community with knowledge of the common system, understanding how to improvise within the common purpose, and collective recognition of capabilities and limitations. If these criteria are not met, there may be significant challenges for an effective emergency response.

Therefore, additional roles and mechanisms that are emerging out from the operational context should

be integrated in the new emergency management model facilitating joint coordination (Figure 1).

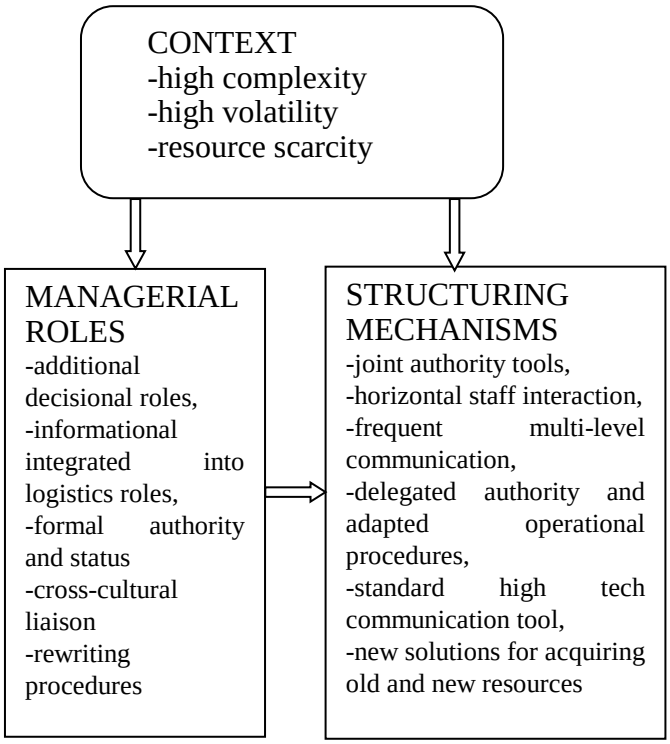

Figure 1. Managerial roles and structuring mechanisms that may contribute to joint emergency system

The operational context of the High North characterized by high complexity, volatility and resource scarcity calls for new managerial roles and structuring mechanisms. The Figure 1 summarizes the additional elements, which should be integrated into the emergency management system when a wide range of actors are involved.

5 CONCLUSIONS

In this paper, we have illuminated the relation between context and the crisis management systems. We have shown how context characteristics and the variety of managerial roles may influence on the need for tailor-made structuring mechanisms. There is the need for preparedness systems with a broader range of managerial tools to face the challenges of complexity and volatility. The dynamic capabilities are needed at all levels of management in order to meet the unpredicted challenges, even if new roles and functions may have to be developed and coordinated. Thus, we are in need of the sufficient knowledge of the operational context and the knowledge on how to reconfigure the emergency system models within the preparedness system.

The findings provide some ideas for further research. There is a need for more in-depth case studies of how the crisis management systems function in different contexts. In particular, there is a need to look into the different roles and adjacent capabilities of the command system. In addition, the importance and limitations of different structuring mechanisms should be studied. Cross-country studies may bring more understanding of institutional issues and how one may bridge institutional differences in joint operations. The development and implementation of joint training programs and best practice competence schemes should also be studied in further detail.

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