

Strategic Approach and Initiatives Streamlining Emergency Operations in Poland

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Doi:10.5901/ajis.2014.v3n1p385

Abstract

An increase in the number and consequences of threats, disasters and disruptive events to be a tremendously significant problem in today's world, especially in highly urbanized regions. The intensification of emergencies obliges public administration to continuous alignment of operations to current requirements with regard to combating these threats. The foregoing determinants induced the undertaking of research on rudiments for effective operations in emergency management. Based on studies carried out in Poland potential problematic areas in emergency management were identified. A spotlight was brought to the strategic approach, including the strategic objectives set and initiatives designed to attain them.

Keywords: emergency management; emergency operations; strategic approach; effectiveness; disaster; State Fire Service

1. Introduction

The increased probability of occurrence and intensity of threats engendered by the evolution of civilization such as e.g. natural calamities, contaminations, epidemics, traffic accidents or industrial disasters, is an established fact (Tatham and Houghton, 2011; Kusumasari, Alam and Siddiqui, 2010). As argued by L.N. Van Wassenhove (2006) "in present days every year there are 500 disasters occurring where the losses run into 75,000 dead and 200 million injured". The increasing scale of hazard is evidenced by the statistical data such as e.g. Federal Emergency Management Agency (FEMA), International Strategy for Disaster Reduction (UN-ISDR), or WHO Collaborating Centre for Research on the Epidemiology of Disasters (CRED). According to analysis results, only in 2011 natural disasters a total of 30,773 people died, caused 244.7 million victims worldwide and economic damage was the highest ever registered, with an estimated US\$ 366.1 billion (Guha-Sapir, Vos, Below and Ponserre, 2012). Additionally, in the wake of climatic changes, natural degradation and rapid urbanization, a further increase in natural disasters and multiplication of their strength is projected within the coming 50 years (Schulz and Blecken, 2010). Contemporary hazards cannot be eliminated (Sagun, Bouchlaghem and Anumba, 2009). However, it is possible to undertake mitigation efforts, mostly to prepare for their occurrence, adequately safeguard and thus scale back their impact impetus. The scale of hazard determines the comprehensiveness of operations undertaken in emergency management.

The primary objective of this study is to analyse the foundations for effectiveness of emergency operations. While exploring this subject, the diversity and nuanced aspects of emergency operations were illustrated. Based on research conducted in Poland, the strategic approach and the problematic areas and initiatives streamlining emergency operations were presented. The result of the analysis is a response to the following questions: Which problems may occur during emergency operations and how to avoid them?

2. Methodology

This paper involves the principles behind execution of emergency operations within a broad-based context, against the backdrop of current thought trends and emergency management practice. The research procedure rests on both literature reviewed as well as empirical research and has been performed in three steps as follows:

1. Characteristics of emergency operations effectiveness against the background of the theory of emergency management (literature review).
2. Examination of problematic areas and activities streamlining emergency operations (field research).
3. Formulation of generalizations and designation of directions for further research (concluding).

Field research was conducted across the Śląskie province in Poland, where the climate is marked by temperate features, though the civilization advancement and environmental changes spurred increased frequency and intensity of such occurrences as: floods, hurricanes and long-lasting draughts. Around 160,000 fires and 240,000 local threats (natural catastrophes, technical failures, transportation accidents and other threats to life and property) are reported across the country each year (Concise Statistical Yearbook of Poland 2012). Also, there are induced seismic shocks chiefly prompted by mining.

The selection of Śląskie province was motivated by the opportunities of carrying out the studies and development dynamics of that region. Specifically, this is one of 16 regions in Poland, being ranked 2nd in terms of the size of GDP and investment expenditures. This area attracted substantial industrial potential of the country. This is the most urbanized region of Poland (78.4% of urban inhabitants) and has the highest population density (377 persons/ km², where a national average is 122 persons/ km²) (Strategia Rozwoju Województwa Śląskiego). Though, this is also the area with the maximum rate of fires and local threats (over 12% of occurrences over the whole year) (Statistical data of the Chief Headquarters of the State Fire Service).

In Poland the State Fire Service is the leading unit of emergency management. For this reason, the analysis of operations effectiveness was carried out in units of the fire brigade. A field survey was conducted in 2011 in partnership with the Provincial Headquarters of the State Fire Service in Silesia. The survey covered 31 Urban and District Headquarters of the State Fire Services which represents almost 10% of headquarters in Poland.

3. Literature Review

3.1 Emergency

David Alexander (2005, p. 159) defines emergency as “an imminent or actual event that threatens people, property or the environment and which requires a coordinated and rapid response”. Moreover, he also writes that emergencies are unanticipated, sudden and encompass both disasters (e.g. floods, earthquakes, tornados, chemical spills, collapses of industrial infrastructure) as well as small disruptive events (e.g. road traffic accidents) (Alexander, 2005). Emergencies are characterized by lack of certainty as to the unfolding of the situation as well as to the scope of manners, methods and techniques for operations execution. Crucially, the approaches, proposed in literature, are grounded on the analysis of their intensity and scale of gravity (Gardoni and Murphy, 2010; Mishra, Fuloria and Bisht, 2012). For instance M. Middleton and A. Franks identified five categories of hazards which were classified as follows (Shaluf, Ahmadun and Mustapha, 2003):

- minor – short duration, minor problems, no outside media comment;
- significant – lost time accident, short term, minor effects, noted in local newspapers;
- severe – single or few serious injuries, few people require hospital treatment, emergency plan in operation, considerable local news with inside page national note;
- major – single or several fatalities, many injuries, headline national news and continuing local news attention;
- catastrophic – many fatalities, numerous serious injuries, international TV news.

The classification of emergencies outlined relies on their direct implications. Yet, in the greater perspective, these hazards are likely to trigger a decline in social-economic life conditions (Uscher-Pines, 2009; Marulanda and Cardona, 2010). Therefore, taken together both direct as well as indirect ramifications of hazards require appropriate preparation if emergency operations prove to be critical.

3.2 Emergency management and emergency operations

Emergency management is a part of a national and international security system built upon preventing and combating threats and emergencies as well as countering their effects. On the whole, it is defined as “the process of coordinating an emergency or its aftermath by communicating with participants and organizing the deployment and use of emergency resources” (Alexander, 2003, p. 118). It constitutes a suite of units, organizations and ventures being interdisciplinary in their character and their deployment hinges on the type of the threat (McGuire and Schneck, 2010). Its purpose is to minimize potential hazards, prepare for their occurrence, execute effective and efficient response actions and restore to the previous state. From the holistic perspective, emergency operations comprise two primary periods: stabilization and realization (Metz and Zabinsky, 2010; Sienkiewicz-Małjurek and Krynojewski 2010). The stabilization period embraces the round of preventive activities as well as those preparing for potential hazards occurring. By and large, it represents an

entirety of organizational operations undertaken on all levels of authority, arrangement and implementation of investments impeding potential perils as well as the formulation and implementation of operational procedures (Hale and Moberg, 2005; Reddick, 2011). Whereas the completion time involves the examination of emergency situations by means of planned actions, accomplishment of emergency operations, minimization of losses and recovery from ravages. This phase includes the response and recovery functions (Kusumasari and Alam, 2012). In the aftermath of each event, conclusions are drawn setting the stage for reinforcing or enhancing the ventures performed (Ozcevik, Turk, Tas, Yaman and Beygo, 2009). Thus, the feedback is garnered and the first phase of the new emergency management cycle – the mitigation phase is ushered in. It indicates the continuity of the emergency management process and constant advancement of emergency operations.

The responsibility for commencing and performing actions in emergency management is assumed by relevant, single-person bodies at each organizational tier of the given state which constitutes a form of the political authority (Andrew and Kendra, 2012; Henstra, 2010; Sienkiewicz-Malyjurek and Niczyporuk, 2010). Principally, these bodies are charged with steering, monitoring, planning, responding, and preventing the spillover of threats. The execution of the operations is shored up by designated administration units, e.g. departments of emergency management and population protection. Nevertheless, the quality level of operations performed is driven not only by the tasks and decisions made by public administration, but also by ventures undertaken by all units forming the emergency management system (Kruke and Olsen, 2012). Within a holistic context, the entities establishing this system may be seen as falling into the following categories (Sienkiewicz-Malyjurek and Krynojewski, 2010):

- state administration bodies: units and organizational teams, emergency management centres,
- intervention-rescue units – among others, the State Fire Service, other units of fire protection, Police, units of the State Medical Rescue system, medical controllers, Border Guard, Maritime Search and Rescue Service and other relevant state bodies, agencies, inspectorates, services and so forth,
- non-governmental organizations, - e.g. Voluntary Fire Brigades, Voluntary Water Rescue, Voluntary Mountain Rescue, humanitarian organizations, public benefit institutions,
- society – as part of self-help, neighbourhood assistance, self-evacuation, in-kind and financial assistance to victims,
- media – involvement in providing true and reliable information and data, acting as information means on potential threats, security methods, evacuation urgency, needs for victims and operations executed.

Depending on the hazard type, rescue units set up temporary operational teams focused on efficient and effective accomplishment of operations.

Emergency operations are efforts seeking to eliminate perils and to protect life, health, property and environment. They take place immediately following threats and are continued through relief work (Pheng, Raphael and Kit, 2006). Emergency operations entail complex and multi-dimensional actions. Specifically, they necessitate swift and effective intervention not only by one single unit, but by coordinated activities of all services, inspections and brigades crucial to responding to the situation. As an example when faced with the threat of chemical contamination, the actions are launched by the State Fire Service, Police, Emergency Services, as well as Sanitary Inspection and Environmental Protection Inspection. Each of these units possesses specific expertise and competencies and are tasked with discharging their obligations under certain circumstances, based on what has already been accomplished and information obtained from varied sources from other units and while collaborating with them. Beyond that, in an emergency, within a short time a variety of crucial decisions need to be made, thousands of people evacuated, systems for monitoring and coordinating actions developed, or a host of procedures activated. Hence the effectiveness of emergency operations is a result of prior planning and arranging response actions within the emergency management process.

3.3 Strategic approach as a base of emergency operations effectiveness

A strategic approach plays a significant part in running emergency operations. Basically, it involves effective application of resources possessed based on an analysis of the information available combined with the development of operational variants. A strategic management model revolves around the continuity of management processes and integrates four elements: internal management, external relations, programs and services, human relations (Drumaux and Goethals 2007). This approach has a tremendous importance in emergency operations effectiveness due to the dynamics of situational changes, environmental constraints or potential restrictions (Johnson, 2007). Literature review made possible to pinpoint the primary areas for assessing the effectiveness of emergency operations. These include:

- completion time (Subramaniam et al., 2012; Gismondi and Huisman, 2012; Banomyong and Sopadang 2010),

- planning, arrangement and running emergency operations (Perry and Lindell, 2003; Jongejan et al., 2010; Kusumasari and Alam, 2012; Kusumasari, Alam and Siddiqui, 2010),
- collaboration (Kapucu, 2008; Kożuch, 2011; Winkelen, 2010),
- costs (Hoop and Ruben 2009; Kenny, 2012),
- oversight of operations (Ozcevik, Turk, Tas, Yaman and Beygo, 2009; Hoop and Ruben, 2009).

Effectiveness of emergency operations rests on the human and in-kind resources used as well as collaboration degree, communication methods applied and information possessed (Lubitz, Beakley and Patricelli, 2008). It requires coordination of activities performed by multiple technically autonomous entities, consolidation operation procedures and technologies exploited (Miles, Green and Svekla, 2012; Kapucu, 2008). In essence, it draws on the pool of capacities, competences and expertise of both persons guiding the operations as well as units engaged in them (Stephenson, 2005). It results from the fact that the effectiveness of operations performed relies on accurate and rational decisions, being divergent in each situation while taken under stress and in a short time, within volatile and uncertain settings (Sienkiewicz-Malyjurek, 2012). Additionally, even the same type of threat in each case has a distinct character, proceedings and intensity. By the same token, the interaction and accumulation of threats may emerge. Also, organizational, cultural and divergence may pose additional obstacles. The specific aspects of the area under threat has significant implications for running the operations. These factors generate the risk of errors and disorganization of operations. In consequence, even well-prepared and experienced units may encounter problems while executing their activities, and each problem and error may have further ramifications.

4. Findings - Measures Improving Emergency Operations in Poland

Analysis of problematic areas and initiatives streamlining emergency operations in Poland base on the primary areas for assessing the effectiveness of activities accomplished. These include: completion time, planning, arrangement and running emergency operations, collaboration, costs and oversight of operations. Overall, these areas were considered when analysing the initiatives reinforcing operations undertaken in emergency management. The evaluation of requirements delivery in running emergency operations was outlined in Figure 1.

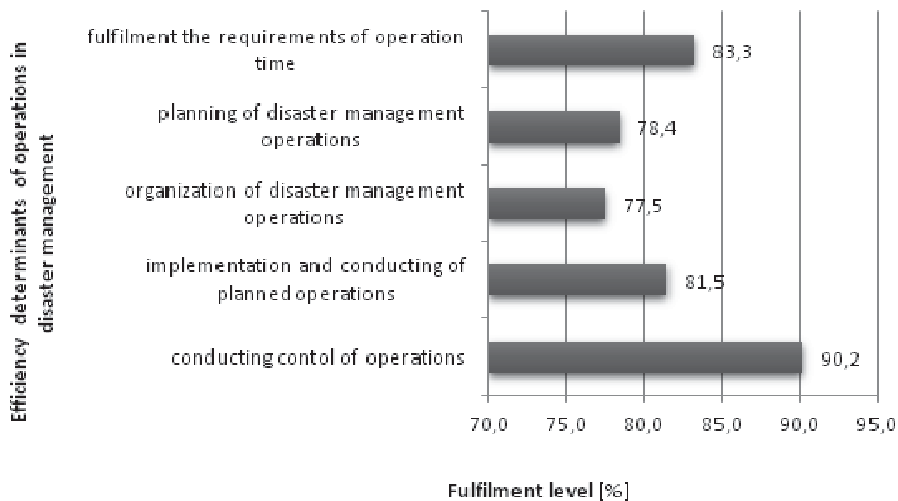


Figure 1. The evaluation of requirements delivery in running emergency management operations in Poland

Collective compilation of problems and improvement actions with regard to running emergency operations was depicted in Table 1.

Table 1. Primary problematic areas and improvement actions for emergency operations

Area	Problems	Improvement actions
Time completion	<ul style="list-style-type: none"> - Communication and data transmission - Obstacle to reaching the threatened place - Rescue capabilities - Reliance on collaboration with other units - Limited financial and equipment - Failure rate of vehicles and equipment 	<ul style="list-style-type: none"> - Inspections and controls - Localization of units equipped in close proximity to potentially threatened places - Upgrading and modernization of equipment as funds permit - Training and exercises (implicational, practical, internal and facility) - Consultations, briefings, and discussions on operations executed
Planning operations and preparedness in the event that hazard occurs	<ul style="list-style-type: none"> - Variety of potential threats occurrence - Volatility and unpredictability of circumstances for operations - Unreliable and out-of-date information - Manner and form of collaboration with other entities - Low headcount 	<ul style="list-style-type: none"> - Upgrading procedures and operational and rescue plans - Control of combat readiness - Consultations, training, exercises, views exchange
Organization and execution of operations	<ul style="list-style-type: none"> - Variety of threats and thus circumstances, forms and methods of operations - Swift infrastructure development - Fake alarms - Contact, communication and form of collaboration for services involved in operations - Turnover of personnel and low employment rate for persons with extensive experience 	<ul style="list-style-type: none"> - Analysis of the use of force and resources - Consultations and joint exercises with collaborating services as funds permit - Upgrading procedures and operational-rescue plans - Temporary) controls verifying familiarity of procedures and guidelines
Collaboration with other units	<ul style="list-style-type: none"> - Divergent operation procedures - Contact and incompatibility of IT systems - Variety of operation areas of specific institutions - Different assessment ascribed to significance of the given issue in various organizational units - Hermetic isolation of information in units 	<ul style="list-style-type: none"> - Agreements on collaboration - Development of common rescue procedures - Meetings, experience exchange, competition as funds permit - Maintaining working contacts between corresponding cells - Making analyses from operations available
Equipment and operation costs	<ul style="list-style-type: none"> - Limited funds for maintaining appropriate technical and organizational state (periodical inspections, services, funds for keeping the full combat readiness, retaining technical facilities) - Insufficient funds that enable to conduct common trainings schemes and meetings - Unpredicted events 	<ul style="list-style-type: none"> - Acquiring funds from superior units - Acquiring funds from sponsors - EU projects
Control of own operations	<ul style="list-style-type: none"> - Variety and unpredictability of threats which affects the specifics of preparedness to operations and potential control actions - Turnover of personnel - Limited time possibilities 	<ul style="list-style-type: none"> - Verification of prior activities - Inspection of combat and operational readiness - Control of attainment of plans in specific organizational cells

The strategic approach to emergency management in Poland seeks to ensure the continuity of the processes realized in each situation and under each circumstances of the action. In such a process, following the hazard occurrence and assessment of the situation, the resources are mobilized and procedures for response operations activated. The resources are transferred as part of service provision as well as evacuation execution. The specific operations are accomplished under time pressure, mostly in parallel and they are accompanied by a unceasing flow of information. The final phase of the process is the analysis and assessment of operations which serves as the basis for continuous progress of future ventures. This phase enables to identify problems and define the directions for improvement actions based on the strategic objectives embraced which in Poland include:

- Streamlining the organization of emergency operations;
- Streamlining the system for recognition and analysis of perils;
- Bringing the logistic base and equipment resources into alignment with ongoing needs;
- Training the personnel;
- Boosting international collaboration;
- Enhancing social awareness.

Drawing on the analysis of current determinants, each strategic objective was assigned with fundamental directions for improvement actions. These efforts, alongside the strategic objectives formulated in relation to the emergency operations process were illustrated in Figure 2.

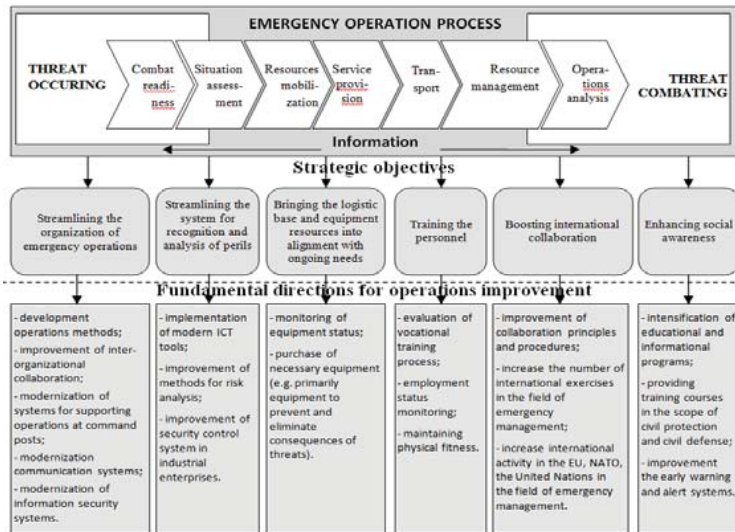


Figure 1. Strategy map for emergency operations leading in Poland

The directions guiding strategic measures in emergency operations in Poland apply to the advancement of both the technical systems as well as equipment base, as well as improvement of operation procedures and plans. Basically, they are designed to shape organizational behaviour of all entities within the emergency management system. They have an impact on the quality of operations performed through enhancing the communication level and bolstering the international collaboration. After all, the processes outlined provide the foundation for effectiveness of emergency operations.

5. Conclusions

This study provides an overview of factors driving the effectiveness of emergency management in Poland, problems and improvement actions launched in this field. It addresses the principles and determinants behind executing emergency operations, potential problems in this respect and adequate improvement actions in a comprehensive manner. Based on analyses conducted it may be claimed that:

1. Emergency operations are a set of heterogeneous actions and operations executed in parallel. They are characterized by a huge number of potential relations within an operational environment. These operations are commenced under circumstances marked by uncertainty, dynamics, risk and time deficiency. Therefore, a fundamental significance is attached to the strategic approach built upon forecasting, planning, and systematic control aimed at identifying the problematic areas and improvement measures.
2. Primary problematic areas for running operations in emergency management in Polish circumstances include securing necessary resources and executing common operations. Furthermore, restrictions could originate from low employment rate for persons with extensive experience, problems with communication, inter-organizational collaboration and different assessment ascribed to significance of the given issue in various

organizational units. The source of problems could also be variety and unpredictability of threats, limited time possibilities and problems with access to affected areas. These factors largely adversely affect the quality of operations.

3. Fundamental significance in emergency management has the strategic approach including decision-making problems and resources management. The strategic approach takes into account environmental, political and social circumstances. It is built upon forecasting, planning, and systematic control aimed at identifying the problematic areas and defining the strategic objectives for improvement actions. The main strategic objectives in running operations in emergency management in Poland include organizational and technical streamlining of emergency management operations and amplification of collaboration with international bodies and also with local societies. Activities taking in these areas are basis for improvement of emergency operations realized in emergency management.

6. Acknowledgments

Author would like to thank Mr. Jeremi Szczygłowski the Deputy Commandant of the Provincial Headquarters of the State Fire Service in Silesia for assistance in research and valuable suggestions and comments.

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