

# Improving Logistics Processes in Humanitarian Assistance in Emergency Situations on the Territory of Bulgaria

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## Summary:

Logistics and supply chain management in providing humanitarian assistance in times of emergency (disasters, breakdowns, catastrophes and military conflicts) comprise a topical theoretical and practical issue related to handling humanitarian crises. The paper presents an evaluation of logistics practices implemented during humanitarian crises on the territory of Bulgaria. Research has been carried out on the opportunities for response to crises in the area of planning, evaluation of the scale and aftermath of crises, the request for providing support, the pooling up of resources, supply, transportation, tracking and tracing systems, inventory management, distribution and aid provision. The results from the study help identify the potential weaknesses and problems related to conducting logistics activities needed to handle potential humanitarian crises on the territory of Bulgaria, as well as defining the respective measures to be taken with regard to improving the efficiency of these actions.

**Key words:** humanitarian logistics, logistics processes, humanitarian assistance, emergency situation

**JEL Classification:** M10; M19, H84

## 1. Introduction

The effects of climate change, world epidemics, ecological disasters, the global financial and economic slump, war conflicts and other adverse consequences for the population are among the major challenges to global and regional security that the world is facing today. Every year humanitarian crises affect the lives of millions, thousands are forced to leave their homes because of wars, entire cities are razed to the ground as a result of earthquakes, floods take a heavy death toll. The need to take timely action to overcome these challenges raises the importance of humanitarian aid organizations, attaching greater relevance to the theory and practice of humanitarian logistics. Regardless of the nature of the causes of the humanitarian crisis, whether a natural disaster or a military conflict, people's immediate needs are always the same – shelter, food, clean water and medical assistance.

The problems related to tackling humanitarian crises, the adaptation and designing logistics systems in the field of humanitarian assistance provide the bases of this study. Its goal is to present an analysis of the implemented logistics practices for overcoming potential humanitarian crises on the territory of Bulgaria, to identify potential weaknesses and problems in the

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process of conducting logistics actions and to formulate recommendations for undertaking remedial measures to improve their efficiency.

It should be pointed out that this study does not address the issues related to the logistics practices used in the management of production of material resources, needed for humanitarian assistance due to the specific nature of the 'humanitarian' supply chains and to the limited classified information about organizations and participants in providing humanitarian assistance in the event of disasters, breakdowns and catastrophes.

### **2. Defining key terms and theoretical issues**

Over the past years the humanitarian crises resulting from extreme natural phenomena (devastating earthquakes, floods, among other natural disasters) or conflicts have had an adverse impact on the establishment of market relations and the reforms conducted in all spheres of social life. In the period between 1970 and 1990 there was a dramatic increase in the number of disasters. It is assumed that the number of natural disasters and man-made ones will increase five times (Thomas and Kopcak, 2005: p. 7) and in the next 50 years the countries will have to earmark around \$64 trillion in order to tackle humanitarian crises (Blecken, 2010, p.87).

A disaster is a significant disruption of the regular functioning of society caused by natural phenomena and/or human activity and leading to adverse effects on the life and health of the people, property, economy and environment, whose prevention, control and tackling exceeds the capacity of the system used to service the regular actions to protect society (Definition according to Article 2, Zakon za zashtita pri bedstvya, 2006). Humanitarian crisis is usually

defined as a dramatic and adverse event or a series of events which present a major threat to the life, health, safety and security of the society or any big group of people. Humanitarian crises are often caused by a natural disaster or a conflict and give people a reason to pool efforts to overcome the effects of deprivation of natural and material resources, spreading disease and epidemics, increasing migration pressure, changes in social status, among many other adverse effects.

Humanitarian actions are a moral imperative and a major manifestation of the solidarity of citizens from all over the world with the disaster victims (Communication from the Commission to the European Parliament and the Council, 2007). In order to provide efficient humanitarian assistance it is of utmost importance for the organizations to observe the key humanitarian principles of being humane, neutral and impartial. The humanitarian principles are outlined in the Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations (NGOs) in Disaster Relief and Resolution 46/182 of the UN General Assembly. They derive from the key principles of the Red Cross (Mackintosh, 2000).

To gain unrestricted access to the victims and be in a position to provide assistance and protection, guaranteeing their safety and security, participants in humanitarian operations require appropriate operational environment, called humanitarian space. Creating and maintaining humanitarian space is a complex task due to the dynamically changing nature of the environment in times of disaster – it often happens that access to some areas is restricted, adverse weather conditions lead to a number of devastating disasters occur, etc. Due to the dynamic nature of the space it is necessary that organizations prioritize the different principles (humanity, neutrality

and impartiality) depending on the available information about the state and the needs of the beneficiaries.

To manage and alleviate humanitarian crises it is necessary to undertake measures to provide aid to the victims and reduce their vulnerability. Performing the actions related to the assistance measures is also defined as humanitarian aid. Humanitarian operations, humanitarian actions, humanitarian assistance, humanitarian aid and humanitarian intervention are common interchangeable notions. Humanitarian operations encompass a wide range of actions related to providing material and technical assistance (necessities of life to meet the needs of the victims; transport; tracking in case customs clearance is needed; inventory management and delivery) which is highly needed in the event of emergency. Humanitarian assistance means material and logistics aid, assistance and protection aimed at providing support to a community hit by a humanitarian crisis, resulting from a war or riots under extreme situations and circumstances, caused by natural disasters or human behavior. It is important to point out that needs in times of disaster are a variable which calls for paying special attention to the degree of operations flexibility.

Humanitarian assistance includes a number of actions which can be classified in four groups (The Sphere project, Oxfam, 2000: pp. 299-311): providing water and sanitation, providing food (maintenance, foodstuffs), providing shelter (accommodation and other needs) and providing medical help and healthcare. The implementation of the logistics concept in humanitarian practice takes into account the impact on the efficiency and effectiveness of humanitarian assistance. The key criteria for this efficiency and effectiveness include costs, lead time, quality etc. The optimization of the criteria and the establishment

of sustainable partnership between the participants in the humanitarian assistance facilitate the improvement of the processes and the efficient resource management.

Over the past years, the term humanitarian logistics has been used ever more often in academic literature and in various statements made by institutions and organizations involved in humanitarian assistance in the event of disaster, breakdown and catastrophe. That is why there is a tendency towards differentiating and identifying humanitarian logistics as an individual branch of logistics dealing with the organization, coordination and implementation of different actions targeted at providing timely and efficient support and meeting the needs of those groups of the population who have suffered in times of disaster, breakdown and catastrophe. Since it has been proven that the cooperation between the supply chain members improve the efficiency of the chains as a whole (Rakovska, 2011: p.103), the proper coordination and cooperation between all interested parties is of great importance to the efficient humanitarian assistance.

The humanitarian logistics processes are the same as the ones in business logistics with the addition of the processes related to the evaluation of the scale and the aftermaths of the humanitarian crisis and the mobilization. Generally, there processes are (Thomas, 2004: pp. 64–65.):

1. Planning and preparation – the tasks to be completed, aftereffects, people and organizations in charge, necessary resources;
2. Evaluation of the disaster scale and its aftereffects – establishing the incidental needs of the affected population, capacity estimate, the damage caused to local infrastructure;
3. Assistance request. Resource mobilization – organizational, material, information and financial resources;

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4. Procurement – establishing contacts with those suppliers who would provide the right supplies at the right price, at the right time, in the right place and the quantities to satisfy the needs of the victims;
5. Transport – the organization of transport should both facilitate its key function but also exercise control upon the value of transportation costs while continually monitoring, managing and looking for alternative solution to optimize them;
6. Tracking and tracing systems – usually they comprise the link between the information systems and the reality (flow of goods) in the logistics networks (Shamsuzzoha and Helo, 2011). The goal of traceability is to identify the lot of finished products as well as raw materials used for processing those finished goods, and to track this lot and each part of it in the supply chain (Vodenicharova, 2013). While "tracking" systems provide information in real time about the location of a given product as it is moving forward along the supply chain, "tracing" systems provide a track record (backwards) of the full movement of that same product;
7. Storage and inventory management – inventory planning and positioning has become a strategic goal of humanitarian organizations in trying to produce a prompt response in emergency;
8. Distribution and assistance – direct distribution (the movement of the flow of goods from the humanitarian organization to the beneficiaries) and indirect distribution (movement of flow of goods through intermediaries).

### 3. Research methodology

According to the 2009–2013 National Programme for Disaster Protection, the complex natural characteristics and the geography of Bulgaria and its location in a highly seismic region make it extremely vulnerable to natural and technogenic

disasters and breakdowns, which can cause considerable human and material losses (Natsionalna programa za zashtita pri bedstvya 2009 – 2013: p.4). Between 2010 – 2013 the average number of crisis situations was approximately 3,135 with the biggest share (61%) of fires, 33% - natural disasters, 5% - breakdowns, 1% - other crises situations due to pollution, epidemics etc.<sup>1</sup> This data show that Bulgaria belongs to the group of territories that are exposed to a particularly high risk. This fact determines the key research issues related to studying and clarifying the logistics actions in providing humanitarian assistance in Bulgaria, identifying the key problems and determining the measures to overcome the challenges in the field of humanitarian logistics.

Field research using the method of conducting on-site interviews was implemented in order to collect data. The participants are the authorities from Bulgaria's executive branch of power, as well as organizations whose activity is related to humanitarian assistance in emergency situations. The main legal act that regulates disaster management in Bulgaria is the Disaster Protection Act (DPA)<sup>2</sup>. According to national legislation, the functions in the event of disaster are distributed among the following executive bodies: Council of Ministers (CM), Interagency committee for recovery and assistance at the Council of Ministers, Ministry of Interior (Mol) and in particular "Chief Directorate of Fire Safety and Civil Protection"<sup>3</sup>, other ministries and institutions (Under article.63, para1 of the DPA), the Bulgarian Red Cross (BRC),

<sup>1</sup> Author's calculations based on: <http://www.nsi.bg>.

<sup>2</sup> Adopted December 6<sup>th</sup> 2006, revised, SG, issue 102 of 19/12/2006 (with further amendments).

<sup>3</sup> National specialized organization at the Mol providing fire safety, rescue and disaster, breakdown and catastrophe protection of the population and projects of the national economy

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National Institute of Geophysics, geodesy and geography (NIGGG) at the Bulgarian Academy of Sciences (BAS), The National Institute of Meteorology and hydrology (NIMH) at the Bulgarian Academy of Sciences, Rectors of universities, district governors and mayors of municipalities.

The target group to participate in the research has been objectively selected, which guarantees reliability of the questionnaire results. The research addresses respondents with access to the necessary information and the responses are valid, and their quality is guaranteed and can be analyzed. The organizations included in this research and the number of respondents and their occupations are as follows:

- Chief Directorate of Fire Safety and Civil Protection at the Mol, Sofia – one employee who is an expert in sector "Logistics" was interviewed;
- District Office of Fire Safety and Civil Protection, the town of Pernik – two employees interviewed: the chief of the District Office and an expert in sector "Planning and preventive measures";
- National Public Council of the Bulgarian Red Cross – three employees were interviewed: a chief expert Logistics, Director of Directorate "Disaster Management", an expert in Directorate "Disaster Management".

It should be pointed out that a significant part of the institutions refuse to provide information due to confidentiality and national security reasons.

The interview was conducted as a personal interview based on structured questionnaire and as a follow-up telephone call to further clarify additional questions which explain in depth the issues researched. The questionnaire has been developed to meet the goals of the present study and it aims to collect information from volunteers

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who represent particular organizations. The interview process is in compliance with the legal restrictions and assent of the management of the organizations was granted in terms of gaining access to information about conducting interviews with people knowledgeable about the activity of a specific organization and their willingness to cooperate in the current research.

The research methodology includes the following main stages: developing the questionnaire, conducting the interview, processing and analyzing the research results.

The questionnaire comprises 31 open-ended and closed questions in total (dichotomous, multiple-choice, Likert scale questions and others). When respondents are asked an open-ended question, they express their opinion by writing a passage which provides for identifying problems, finding the whole range of possible answers, studying the opinion of respondents in depth.

The questionnaire includes several main groups of questions basically aiming to study the logistics processes in humanitarian assistance in Bulgaria, discussed in the previous section, namely: characteristics of the activity of the participating organizations; planning the actions for humanitarian aid; evaluation of the scale of the disaster and the consequences; inventory management; availability of warehouses and spaces, as well as automating the processes in the warehouse with a specialized software; key ways of distribution and resource transportation for humanitarian assistance; cooperation and coordination aspects; explaining existing issues in actions and process management in the field of logistics in humanitarian assistance and outlining all challenges the participants face when overcoming and eradicating the consequences from the disasters.

The interpretation of the results of the current research cannot be narrowed to



implementing statistics calculations to arrive at quantitative parameters, but it is based on perceptions, understanding, analyzing the opinions gathered in compliance with the goal of the research. The analysis of the opinions collected is descriptive and based on the self-assessment made by the representatives of the organizations/institutions that took part in the research.

To make generalizations, present findings, draw conclusions and analyze suggestions resulting from the results and opinions the logical methods of analysis and synthesis, abstraction and generalization, induction and deduction were used. The comparative analysis is widely used. Analyzing the research results can help check the degree of efficiency of the coordination between all participants, set forth in the Disaster Protection Act and the implemented logistics practices to overcome the consequences from the disasters.

#### 4. Analysis of the research results

The research led to defining the responsibilities and the duties of the organizations subject to investigation vis-à-vis tackling humanitarian crisis resulting from disasters, namely:

- Chief Directorate "Fire Safety and Civil Protection" at the Mol, Sofia conducts the following activities: prevention; state fire control; fire extinguishing actions; rescue actions; issuing licences to and exercising control over the activity of traders whose activity is closely related to fire safety; licence and control activity related to fire-fighting products; emergency rescue and recovery activities; operational protection in the event of floods and rescue operations; chemical, biological and radioactive protection in the event of breakdowns and incidents with dangerous substances and materials and handling ecological inci-

dents; early warning and announcement in the event of disasters and air raid threat; operational cooperation with the structures of the European Union, NATO and international organizations; support the activity of the Interagency committee for recovery and relief at the Council of Ministers; methodological and expert assistance for protection against disaster to the territorial executive authorities; protection of the population in wartime or emergency situations; cooperation with the authorities on issues related to preparedness in the event of war, military or emergency situation; information, analytical; scientific and expert activity;

- District Office of Fire Safety and Civil Protection, the town of Pernik: provides staff and machinery for conducting RERA (rescue, emergency and recovery activities) in handling crisis on the territory of Pernik district;
- National Public Council of the Bulgarian Red Cross: participates in the National programme of the Republic of Bulgaria for protection in the event of disasters and provides assistance to the population hit by the crisis; it is part of the common rescue system; executes various tasks prior, during and after the disaster. According to an agreement signed with the government of the Republic of Bulgaria the BRC is committed to accumulating goods for immediate assistance for 5000 people, disaster victims.

The *assessment of the scale of the disaster and its consequences* is a prerequisite for adequate decision making, planning and organizing actions for efficient response to emergencies. The responses given (Table 1) to the question: "Does the organization conduct an assessment of the scale of the disaster and its consequences in an emergency situation?" make it obvious

Table 1. Assessment of the disaster scale and the consequences

Evaluation of the scale of the disaster and the consequences	CG "FSCP" – Sofia	DO "FSCP" – Pernik	NC of BRC
No	-	-	-
Yes	✓	✓	✓
number of disaster victims	✓	✓	✓
evaluation of the needed necessities	✓	✓	✓
evaluation of the infrastructure affected by the disaster	✓	✓	-
Other	-evaluation of transborder effect /floods, radiation etc./; -assisting the activity of the Interagency committee for recovery and assistance at the Council of Ministers; -methodological and expert aid for disaster protection of the territorial bodies of the executive power;		

that an assessment of the disaster scale, the consequences and the allocation of the duties and responsibilities is conducted.

Receiving timely and accurate information, identifying the specific crisis situation and agreeing on it with interested parties is one of the most important prerequisite for establishing efficient coordination. The respondents coordinate their actions related to the assessment of the scale of the disaster and the consequences and their preparedness for humanitarian assistance with the other participants. They are:

- Chief Directorate "Fire Safety and Civil Protection" at the MoI, Sofia coordinates the actions of the common rescue system by agreeing the information and the measures undertaken with ministries and agencies, municipalities, the Bulgarian Red Cross, companies and individual

proprietors, emergency medical care and other health care establishments, non-profit legal entities and military services.

- District Office "Fire Safety and Civil Protection", the town of Pernik works in cooperation with the Ministry of Interior, District Directorate – Pernik, municipalities and mayor offices and other organizations, included in the plan.
- National Public Council of the Bulgarian Red Cross informs the respective directorates "Fire Safety and Civil Protection" at the MoI and the municipal coordination offices.

Logistics procedures and actions needed to provide humanitarian assistance in emergency situations should be planned in advance since during the planning process the circumstances and the humanitarian needs are evaluated and analyzed and necessary measures to be taken and

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the resources needed for carrying out the planned actions are based on the results. Planning protection measures in times of crisis on the territory of Bulgaria is conducted on a territorial principle – national, regional, municipal.

The organizations that participated in the research have developed documentary procedures which they apply in the logistics processes. It has become evident from the research that they have developed plans in

advance related to the other processes in the humanitarian supply chain such as evaluation of the scale of disaster and its consequences, an assistance request and resource mobilization, orders and supplies, transport; Tracking and Tracing systems; storage and inventory management; distribution; assistance.

On the issue of training staff that is in charge of implementing logistics actions the interviewed participants point out that they have been through adequate training

Table 2. Providing resources for humanitarian assistance

Supplying resources for humanitarian assistance	CG"FSCP" – Sofia	DO"FSCP" – Pernik	NC of BRC
Drinking water	Purchase if needed and attracting donors	Purchase if needed and attracting donors	Attracting donors if needed
Drinking water tanks and reservoirs	✓	✓	-
Sanitary and hygienic materials	Purchase if needed and attracting donors	Purchase if needed and attracting donors	
Food	Purchase if needed and attracting donors	Purchase if needed and attracting donors	Attracting donors if needed
Household appliances and equipment	-	-	
Shelter	✓	✓	✓
Linen, blankets, clothes etc.	✓	✓	According to the agreement between the BRC and the Republic of Bulgaria it should provide these resources for immediate assistance to 5000 disaster victims
Medication, medical consumables	-	-	Attracting donors if needed
Rescue operations equipment	✓	✓	✓
Other	If needed, resources are taken from the State reserve, including medication and medical consumables	Request for assistance on the part of CD"FSCP" at the MoI	If needed, renting water purifying systems from the IFRC



sessions – theoretical and practical (simulation training) at interagency level using the services of external consultants and a small part of them used training services provided by universities.

In terms of *procurement* for humanitarian assistance Table 2 presents a summary. Extending timely support to the population affected in an emergency situation is of crucial importance for successfully handling humanitarian crises. What impresses, however, is that ‘time’ as a factor is often undermined because the respondents stock on limited range of resources for humanitarian assistance, attract charity or purchase necessities after evaluating the need for it. Immediate supply of food and water should be supplied to meet the needs of the affected population.

One of the respondents talked about their experience during the 2005 floods when tens of villages ended up without fresh supply of drinking water and because of the deficit of drinking water in these distressed areas called for inviting private companies such as Devin and Mihalkovo to assist in providing tens of tons of mineral water.

The lack of information about the real physiological need for food, drinking water and water for sanitary and hygienic need can be a serious flaw in planning the potential needs when identifying the potentially affected population in the respective territory or area.

Evaluating the share of the resources requested for humanitarian support by the organizations/agencies on the bases of the location of the suppliers led to the conclusion that around 75% of the requested resources for humanitarian assistance come from local suppliers. Undoubtedly, using the services of local suppliers should be a priority because this stimulates the domestic economy, optimizes expenditure and lead time. Local suppliers take the highest share in supplying drinking

water, food, linen, blankets and clothes (from 80 % to 100%). Orders for the rest of the resources like drinking water tanks and reservoirs, sanitary and hygienic materials, medication and medical consumables, rescue operations equipment and shelter the Chief Directorate FSCP allocates the quantities almost equally between local and foreign suppliers while BRC once again gets 80% of the quantities from local suppliers. The results from the interview showed that FSCP at the MoI, Sofia does not provide household appliances and equipment needed for humanitarian assistance. The supply of these items for BRC is divided into 20% from foreign suppliers and 80% from local ones. In case the water sources get contaminated the BRC can provide water purifying systems within 48 to 72 hours renting them from the following countries – Montenegro, Serbia, Croatia and Macedonia in compliance with the approved regulations of the International Federation of Red Cross and Red Crescent Societies.

The framework agreements play an important role with respect to saving resources, improving the quality and efficiency of the delivered goods and services. When asked about the existence of signed framework agreements, the respondents gave negative answers, which suggest that they do not have preliminary framework agreements with their suppliers. This, on its part, has an adverse impact on the efficiency of the reaction of the organizations in emergency situations.

The CD FSCP at the MoI holds procedures for the award of public supply contracts for the delivery of the necessary resources for humanitarian assistance, whereas the procedure held by the BRC is based on collecting tenders from the suppliers.

The evaluation and the selection are important managerial decisions and an important stage in the supply process.

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For that purpose it is necessary to define certain criteria to evaluate suppliers. The organizations that took part in the research carry out an evaluation of their suppliers and determine the importance of the respective criteria (cost, quality, terms of payment, delivery dates and presented references – which provide evidence about their previous experience). CD"FCSP" at the Mol place the greatest importance on the cost criteria (60%), followed by the delivery dates (30%), quality (20%) and terms of payment (10%) and no references as to the previous experience of the supplier are required. The Bulgarian Red Cross ranks the criteria as follows: price (50-60%), terms of payment (15-20%), quality and delivery dates – 10% each, references for previous experience of suppliers (5-10%).

The *level of inventory* of resources for humanitarian assistance (necessities, rescue equipment etc.) plays an important role in maintaining preparedness to meet challenges in emergency situations. The analysis in that respect shows that there are reserves at national, regional and local level.

Inventory management is of key importance to guaranteeing the continuity of the processes and the implementation of various technological platforms facilitates its efficiency. The information that the respondents gave on the issue of using inventory management systems points to the existence of such technologies and determines inventory management as "fully efficient". The facts, however, show a different reality. The question: "In the event of emergency that requires using part of the resources for humanitarian assistance for charity purposes (For example, government's decision to help Japan with beds, blankets and other necessities), how and when will those shortages be filled?" the two interviewed organizations replied that the resources used (the value of the donated resources) will be calculated

and then the resources needed for their replacement will be planned for the next year. Let us assume hypothetically that a new disaster occurs on the territory of Bulgaria before the replacement has happened – this will be extremely disturbing since it will result in chaos and delays in the actions undertaken. Experience shows that in emergency on several occasions procedures for the purchase and delivery of the needed resources have been sped up (2 days) which calls for engaging a big part of the staff in this procedure rather than in rescue operations. In such situations important factors, such as price and quality, are ignored. The respondents point out that planning the respective financial resources needed for the purchase, delivery, maintenance and replenishment of the needed stock is carried out once a year. Once a year the CD FCSP at the Mol initiates procedures for the award of public procurement contracts, though they are very slow because of the long period of time needed for signing the contracts with the suppliers.

The organizations that took part in the research use accounting software (Azhar L) with an additional warehouse management module to manage inventory. It should be pointed out that this software is not specifically designed to manage efficiently inventory since the only information that the consumer gets access to involve the movement of the material flows as they arrive and leave the warehouse, information about the expiry date of the goods and their quantity. In order to manage efficiently inventory special software should be used – one which can automatically determine the point at which the needed resources for humanitarian assistance should be ordered, to generate information notes (with options for rearranging them) etc.

In terms of ownership of *vehicles* the data shows that the share of the own

vehicles is bigger – on average 85% (e.g. BRC has 114 vehicles all over the country) and the remaining 15% of vehicles are rented (for transport of supplies from abroad and through forwarding agents). The organizations in the research have not signed contracts with the owners of the rented vehicles, which is relevant with reference to delivery reliability and the fixed rates of transport services.

*Tracking* material flows of humanitarian aid in emergency is of utmost importance because at any time and in any place information about the location of the respective resources along the logistics chain can be accessed. Respondents say that in our country this is done over the phone, via e-mails, faxes and electronic tables. Although they believe they do receive timely information about the movement of the material flows, the above mentioned sources do not provide an efficient solution to the issue of tracking material flows, which therefore requires the implementation of specialized software.

As part of the structure of the logistics system *warehouses* perform certain important functions. Their underlying function is the creation of time and space utility of the products and their existence makes it possible for the product to be available at any time. The participants in the research have warehouses – central, regional and local ones. According to data provided by the BRC the central warehouse in Lozen receives, classifies, stores and provides goods of various type. Some of these goods have to be distributed to places in the country, while others are kept as emergency stock. BRC's warehouse centres include 3 inter-regional warehouses and 28 district (local) warehouses.

"Azbur L" software product with warehouse management module was implemented in all warehouses and there is also a uniform classification of the items stored in BRC. The entire emergency stock

is centralized in BRC's central warehouse and should the need arise (an emergency situation occurs) it gets repositioned and sent to the respective regional/local warehouses. This, however, results in delays when immediate humanitarian assistance has to be provided.

Both organizations participating in the research claim that the warehouse management is inefficient because there is no common database which could make it possible to access the information from a distance, regular updating/collating data related to the movement of the goods and the documents issued by the different warehouses.

It should be pointed out that sharing storage information via integrated information systems between participants in disaster protection is not common, which in turn results in flaws in the coordination. In some specific cases when information about the availability of certain resources is required, lists are generated and the staff is engaged in the process while the entire information can be accessed by a single "click of a button".

The process of *distribution* of humanitarian aid is of crucial importance to the time needed for response in emergency. Depending on the method of transportation of humanitarian aid the channels of distribution used can be both direct and indirect. The ratio is 80%-95% to 20%-5% respectively.

As it happens, donations in the humanitarian sphere are inadequate for the purposes of humanitarian assistance. When asked: "How do unnecessary ("unwanted") donations hinder the distribution of the necessary humanitarian aid?" respondents answer – 'a lot'. During the 2005 floods the donations collected during the charity campaigns turned out unnecessary. Therefore they had to be sorted out, which in turn slowed down the process of distributing the resources needed for humanitarian assistance. The timely exchange of

information about the specific needs of the population hit by the disaster and the implementation of mechanisms for efficient coordination between the collection points and the organizers of such events can rule out a possible "jamming" of the distribution channel in emergency.

The data gathered during the research show that the organizations/agencies do not use logistics software to manage the supply chain and they have not created joint integrated information systems which they could share.

The main mechanism used to coordinate the operations is the issue of reports and statements, on the basis of which the efficiency of the humanitarian aid provided during and at the end of the operation is evaluated so that certain weaknesses in the management of the logistics processes can be handled. Accountability and issuing reports on the actual actions is seen as a positive fact by the interviewed organizations/agencies.

The close cooperation with representatives of the private sector is typical of the participants in the research. The economic entities are the key factor in delivering the humanitarian aid because they provide the necessary material resources and the services related to customs clearance etc.

In general, the interviewed organizations/agencies describe the way they manage the logistics operations as "relatively efficient". The key problems are related to the preliminary selection of suppliers (lack of signed framework agreements), insufficient information about the needs of the populations hit by the disaster, which results in a number of difficulties in the entire "humanitarian" supply chain and last but not least the lack of specialized software to manage the logistics processes.

Respondents believe that to improve the management of logistics processes in the organizations efforts should be focused on the close cooperation with suppliers, collaboration with the other participants, just-in-time delivery (JIT) and the use of

automated information systems for supply chain management.

The problems and the challenges that the participants in the National programme for disaster protection face are mostly related to the lack of coordination among them due to insufficient, untimely and inaccurate information to satisfy the needs of the victims; destroyed infrastructure which hinders the access and the transport of the resources for humanitarian assistance to the disaster-hit areas; incomplete analysis of the risk of key dangers – seismic, geological, water contamination, chemical, radioactive and biological; lack of legislative regulation of providing resources for protection, exceeding the everyday needs of the common rescue system (CRS); the outdated information about the CRS provided by ministries and agencies, commercial entities and sole traders; inappropriate standards of behavior of the population in the event of disasters; and finally the insufficient financial resources.

### **5. Guidelines for increasing the efficiency of the organization and the provided logistics processes in humanitarian assistance in emergency on the territory of Bulgaria**

The key indicators of timely and efficient assistance to disaster victims are related to the undertaken strategic, tactical and operational tasks and solutions and their coordination in the management of the logistics processes (Table 3).

Meeting demand is a life-saving factor in disaster situations, therefore preliminary planning of the potential needs should be carried out on the basis of an evaluation of the potential victims in the respective danger zones on the territory of Bulgaria. An essential source of information which can facilitate the adequate defining and planning of the needs is the "Sphere Project" (The Sphere project, Oxfam, 2000: pp. 299-311) collection focusing on the minimum standards for the provision of sufficient amount of drinking water, food and other necessities used by

Table 3. Strategic, tactical and operational indicators

Strategic tasks and solutions	Tactical tasks and solutions	Operational tasks and solutions
❖ Defining a mission, goals and tasks	❖ Demand planning	❖ Evaluation of the local and regional capacity and resources
❖ Drafting plans and programmes for actions in emergency	❖ Team planning in emergency	❖ Determining the number of disaster victims and the needs for necessities
❖ Supply planning	❖ Planning the methods for evaluation of suppliers and purchasing the necessary resources	❖ Prioritizing population's needs
❖ Planning and control on the supply chain in emergency	❖ Inventory planning and positioning	❖ Tender procedure execution
❖ Planning the necessities	❖ Developing systems (policies) to inventory management	❖ Review and analysis of the suppliers' offers
❖ Planning the warehouse capacity and network	❖ Planning the mode of transport and routes	❖ Selection of supplier
❖ Planning transport capacity, network and strategy	❖ Other tactical tasks and solutions	❖ Order consolidation
❖ Other strategic tasks and solutions		❖ Ordering necessities
		❖ Purchasing goods
		❖ Delivery mobilization
		❖ Monitoring the movement of material flows
		❖ Acknowledge order
		❖ Recording order and shipment information
	❖ Other operational tasks and solutions	

a big part of the international humanitarian organizations and agencies.

Humanitarian crises have an adverse impact on economies. They result in huge financial losses both for the public and the private sector. This makes it necessary to develop a strategy which can help deal with these adverse consequences. Primarily, the aim should be to use to the full the capacity of the local suppliers, which will lead to positive economic results both for them and the state and from the point of view of logistics this will change the structure of expenditure, which will be a prerequisite for their optimization.

The results from the research show that the participating organizations dealing with the prevention of the disaster consequences have not signed preliminary framework agreements with their suppliers of goods/services which has a negative impact on the efficiency of their response in emergency situations. Globally, agreeing and signing framework partnership and cooperation agreements with the private sector for the delivery of goods and services are a key factor for efficient humanitarian assistance in emergency. Signing such agreements allows the parties to negotiate and determine in advance



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the underlying rules, terms, conditions, procedures and deadlines for the provision of the respective goods/services, as well as the interrelations between the partners. That is why it is necessary that the organizations make special efforts to attract potential suppliers by announcing procedures for the award of public procurement contracts and sign legally-binding deals.

To handle the problems related to inventory management, a suitable technological platform should be implemented, which can be used to exercise accurate control and efficient management of the inventory and the warehouse activities such as: receiving/identifying the goods from suppliers and/or manufacture, placement, inventory management, repackaging, labeling, assembling, various inventory checks (annual, periodic), quality control, as well as fulfillment of orders (preparation for delivery, packaging, loading and dispatching) and others. It is important to provide remote access to and control on the information about the inventory with strictly regulated access to the functions and the data available in the common database.

With the intensified dynamics of the working processes the need for introducing innovative humanitarian logistic information systems, which can provide accurate and update information about efficient disaster management and consequently handling the humanitarian crises aftermaths, is further emphasized. The logistics information systems focus on information flows management, the corresponding material ones and aim to improve the efficiency of logistics activities and they can encompass both activities typical of individual organizations and of the entire supply chain (Dragomirov, 2014). It is appropriate for organizations to plan the purchase of specialized humanitarian logistics software like Helios, LogistiX or the ones used in the private sector. Such changes will facilitate the control over and the information about the movement of the material flows and

render possible the management of the entire logistics process.

To avoid inappropriate, in-kind donations, which often hinder and delay the distribution process, clear and precise messages should be sent out, and charity campaigns and events should be held so that the nature of the needed resources for humanitarian aid becomes apparent.

In conclusion it could be stated that organizations and agencies involved in providing humanitarian assistance in emergency on the territory of Bulgaria should focus on:

- Coordination and cooperation with the participants specified in the National programme for disaster protection – a key instrument for immediate response via sharing information;
- Continuous accountability concerning the performed actions in emergency situations;
- Close cooperation with suppliers;
- Just-in-time (JIT) delivery;
- Use of automated information systems for supply chain management;
- Implementation of innovative information and communication technology and specialized logistics software;
- Comprehensive risk analysis of the main hazards – seismic, geological, water contamination, chemical, radiation and biological;
- Drafting legal regulation on protection resource provision, exceeding the everyday needs of the common rescue system (CRS);
- Updating the CRS database with data provided by the ministries and agencies, companies and sole traders;
- Improving standards of behavior in emergency – by organizing training events in companies, schools, universities and others;
- Providing sufficient financial resources needed for the purposes of humanitarian assistance;
- Conducting training sessions and simulations identical to real conditions.



## 6. Conclusion

The present study outlines the logistics problems related to handling humanitarian crises in emergency situations in Bulgaria. The conducted research illustrates potential weaknesses and problems connected with the logistics actions carried out by participants in the disaster protection processes. The issues discussed are multifaceted which requires cooperation between the directly involved participants in the humanitarian assistance, on the one hand, and of the representatives of the private sector, on the other – manufacturers and vendors. Humanitarian cooperation is an important prerequisite for the successful prevention of the consequences of disasters, breakdowns and catastrophes. Establishing two-party partnerships, the coordination and agreement between them guarantees the efficiency of the logistics processes in times of humanitarian crises. The joint participation of organizations and agencies, specified in the national legislation, and the involvement of the private sector in the process of humanitarian assistance will result in flexible, adaptive and dynamic realization of the logistics processes and the measures taken to handle the consequences of the disasters.

The study also outlines the need for further training qualified staff in order to improve their competence when participating in humanitarian operations, which can be achieved through introducing a subject in the educational institutions and certifying programmes. Nowadays, the greatest deficit is felt in the area of qualified personnel that can interpret information, turn it into knowledge and then share that knowledge with others. Therefore, a new logistics concept about knowledge management is required for the needs of humanitarian logistics.

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