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Economic component in the causes and consequences of emergencies

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Purpose – to elucidate the «economic nature» of an emergencies, to expand the list of reasons for the formation and consequences of the emergencies, taking into account the economic component, and to provide a description of their interrelation in this process.

Design/Method/Approach. This work evaluates and summarizes studies that provide economic characteristics and assess the causes and consequences of a emergencies.

Findings. An analysis of previous studies on emergencies pointed to a limited focus on economic issues associated. In this paper, the authors substantiated the feasibility and proposed to highlight the economic component in the management of prevention of emergencies, in the management of minimizing negative consequences and to consider this component in the classification of types of emergencies. This work focuses on the causal link between economic costs for the prevention, elimination and elimination of the effects of emergencies (economic losses) in the emergency management system. The examples have proved that all of the emergency preceding processes are economical, that emergency actions are limited to an economic factor, and that emergency situations can have economic consequences. An economic component can be both a cause and a consequence of an emergency. At the same time, the economic causes of emergencies directly affect only the economic consequences (inflation - impoverishment of the population), and their impact on the remaining consequences - indirect, due to the impact of other factors-consequences.

Theoretical implications. This research identifies a new classification group "economic circumstances" in the classification of types of emergencies for the causes of the emergence and spheres of manifestation of the consequences.

Practical implications. The isolation and systematization of the economic component of emergencies allows us to take into account the economic factor in the development of appropriate prevention algorithms, actions in emergencies or actions to eliminate the negative effects of these events.

Originality/Value. The originality of the work is to illustrate the connection between the cause of emergencies and each of its manifestations with the help of the fan matrix. This approach has allowed a clearer outline and a clear indication of the causal relationship in the processes associated with the emergency situation. For example, a causal relationship with the types of emergencies based on the economic component is illustrated with the aid of a fan matrix.

Research limitations/Future research. This research is the basis for further improvement of approaches to the estimation of economic indicators of emergencies taking into account the proposed classification groups of types of emergencies.

Paper type – theoretical.

Key words: classification, fan matrix, causal relationship, expenses for overcoming of consequences, insurance, management.

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Економічна компонента в причинах і наслідках надзвичайних ситуацій

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Мета роботи – з'ясувати «економічну природу» надзвичайних ситуацій (НС), з урахуванням економічної складової розширити перелік причин формування та наслідків НС, описати їх взаємозв'язки у цьому процесі.

Дизайн/Метод/Підхід дослідження. Оцінка та узагальнення досліджень, які надають економічні характеристики та оцінюють причини та наслідки НС.

Результати дослідження. Аналіз попередніх досліджень з питань НС вказав на обмежене зосередження на економічних питаннях. У даній роботі обґрунтовано доцільність і запропоновано виділити економічну складову в управлінні запобіганням НС, в управлінні мінімізацією негативних наслідків НС і розглянути цей компонент в класифікації видів НС. Зосереджено увагу на причинно-наслідковому зв'язку між економічними витратами на запобігання, ліквідацію та усунення наслідків НС (економічних втрат) в системі управління НС. На прикладах доведено, що економічний характер мають усі процеси, що передують НС, що дії під час НС обмежені економічним чинником, а також що НС можуть мати економічні наслідки прояву. Економічна компонента може бути як причиною, так і наслідком НС. Разом з тим, економічні причини НС прямо впливають лише на економічні наслідки (інфляція – зuboжіння населення), а їх вплив на решту наслідків – побічний, через вплив решти факторів-наслідків.

Теоретичне значення дослідження. Виокремлено нову класифікаційну групу «економічні обставини» в класифікації видів НС за причинами виникнення та сферами прояву наслідків.

Практичне значення дослідження. Виокремлення та систематизація економічної компоненти НС дозволяє враховувати економічний чинник під час розробки відповідних алгоритмів запобігання, дій під час НС або дій з усунення негативних наслідків цих подій.

Оригінальність/Цінність/Наукова новизна дослідження. Зв'язок між причиною НС і кожним її проявом проілюстровано за допомогою віялової матриці. Такий підхід дозволив більш чітко окреслити та наочно показати причинно-наслідковий взаємозв'язок у процесах, пов'язаних з надзвичайною ситуацією. Для прикладу за допомогою віялової матриці проілюстровано причинно-наслідковий зв'язок типами НС з урахуванням економічної компоненти.

Обмеження дослідження/Перспективи подальших досліджень. Це дослідження є основою для подальшого удосконалення підходів до оцінки економічних показників НС з урахуванням запропонованих класифікаційних груп типів НС.

Тип статті – теоретична.

Ключові слова: класифікація; віялова матриця; причинно-наслідковий взаємозв'язок; витрати на подолання наслідків; страхування; управління.

Экономическая компонента в причинах и последствиях чрезвычайных ситуаций

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Цель работы – выяснить «экономическую природу» чрезвычайных ситуаций (ЧС), с учетом экономической составляющей расширить перечень причин формирования и последствий ЧС, описать их взаимосвязи в этом процессе.

Дизайн/Метод/Подход исследования. Оценка и обобщение исследований, которые предоставляют экономические характеристики и оценивают причины и последствия ЧС.

Результаты исследования. Анализ предыдущих исследований по вопросам ЧС указал на ограниченное сосредоточенность на экономических вопросах. В данной работе обоснована целесообразность и предложено выделить экономическую составляющую в управлении предотвращением ЧС, в управлении минимизацией негативных последствий ЧС и рассмотреть этот компонент в классификации видов ЧС. Внимание сосредоточено на причинно-следственной связи между экономическими затратами на предотвращение, ликвидацию и устранение последствий ЧС (экономических потерь) в системе управления ЧС. На примерах доказано, что экономический характер имеют все процессы, предшествующие ЧС, действия во время ЧС ограничены экономическим фактором, а также ЧС могут иметь экономические последствия проявления. Экономическая компонента может быть как причиной, так и следствием НС. Вместе с тем, причины НС прямо влияют только на экономические последствия (инфляция - обнищание населения), а их влияние на остальные последствия - побочный, из-за влияния остальных факторов-следствий.

Теоретическое значение исследования. Выделена новая классификационная группа «экономические обстоятельства» в классификации видов НС по причинам возникновения и сферами проявления последствий.

Практическое значение исследования. Выделение и систематизация экономической компоненты НС позволяет учитывать экономический фактор при разработке соответствующих алгоритмов предотвращения, действий при ЧС или действий по устранению негативных последствий этих событий.

Оригинальность/Ценность/Научная новизна исследования. Связь между причиной НС и каждым ее проявлением проиллюстрировано с помощью веерной матрицы. Такой подход позволил более четко определить и наглядно показать причинно-следственную взаимосвязь в процессах, связанных с чрезвычайной ситуацией. Например с помощью веерной матрицы проиллюстрировано причинно-следственная связь типами НС с учетом экономической компоненты.

Ограничения исследования/Перспективы дальнейших исследований. Это исследование является основой для дальнейшего совершенствования подходов к оценке экономических показателей НС с учетом предложенных классификационных групп типов НС.

Тип статьи – теоретическая.

Ключевые слова: классификация; веерная матрица; причинно-следственная взаимосвязь; расходы на преодоление последствий; страхование; управление.

Introduction

Modern statistical data prove that the number of emergency situations (ES) has increased in the world recently. The reasons for this are climate change, the advent of new technology and growing demands for this technology control as a result of scientific and technological progress, increasing world's population and changing ecosystems, increasing the number of military conflicts and the occurrence of new hybrid threats. Separately, one must distinguish an economic reason. Increasingly there is information about the underfunding of preventive measures to prevent the onset of man-made disasters. In addition, more and more often the very economic reasons lead to the occurrence of new emergency situations. Thus, attempts by the French government in autumn 2018 to raise fuel prices triggered mass protests that had become riotous and resulted in emergency situations.

The situation in the big spheres is demonstrated in extraordinary situations. Thus, the Tohoku region, North-East Japan, was struck by the gigantic earthquake that happened in the Pacific Ocean near Tohoku, and subsequently hit by a giant tsunami. These dangers inflicted enormous damage on the eastern coast of Japan. Such a loss had a strong impact on both recovery and economic activity in the country as a whole (Mimura, Yasuhara, Kawagoe, Yokoki, & Kazama, 2011).

Every new emergency effective control mechanisms for the rapid emergency situations resolution and development of measures to prevent the occurrence of new emergency situations. This, accordingly, requires some economic expenses.

With this regard, there is a need to increase focus on economic factors related to emergency situations, which can cause them, or among other consequences, to distinguish the economic component of emergency situations in order to prevent and divert them.

Theoretical background

An overview of scientific research on emergency management and its economic basis allowed revealing the following.

Ukrainian researcher V. Yevdokymov with his colleagues characterized the management features of economic activities in emergency situations (Yevdokymov et al., 2016).

Also these problems are devoted to the work of foreign authors. The predominant subject of work of American and German researchers is the principles and construction of emergency management (e.g., Trainor & Subbio 2014), D. McElreath (McElreath et al., 2014) and M. Jansen (Jansen, 2010)). Chinese researchers led by K. Zhou (Zhou, Huang & Zhang, 2011), using fuzzy logic, determined the factors that have an impact on effective emergency management.

The issues of assessment and accounting of the economic component of emergency situations are not, in principle, new. Like in the whole world, in Ukraine, there are many researchers have been involved in recent years. V.O. Vasiichuk (Vasiichuk et al., 2010), V.V. Mogylnichenko (Mogylnichenko, 2008) touched upon the cost of civilian protection during emergency situations. The state of the accounting and analytical system for managing economic activity in emergency situations was considered by Hrytsyshen and Polyak (Hrytsyshen, & Polyak, 2016). E.V. Khlebystov conducted a comparative analysis of Ukrainian and international practices to assess the consequences of emergency situations (Khlobystov, Zharova, & Voloshyn, 2009). G.M. Ploskonos (Ploskonos, 2003) studied from issues of assessment to issues of forming mechanisms for minimizing the economic consequences of accidents and disasters.

Y. A. Opanasyuk proposed the assessment principles of ecological and economic damage from emergency situations in his works (Opanasyuk, & Melnyk, 2013), M.I. Bublyk has developed a

methodology for estimating industrial losses in industrial enterprises in a modern economy (Bublyk & Koropetska, 2012).

Summarizing this review, it can be noted that the main focus of the research was on approaches to emergency management, assessment of the cost of response in case of emergency situations and on elimination of consequences of emergency situations. In some studies, scientific articles and books, emergency reports separately indicate the economic factors of emergency situations and, separately, the economic consequences of the emergency situations occurrence. The causes and consequences of emergency situations associated with economic factors were not well studied. The relation between these two categories is not cached. Our analysis points to the facts that confirm the relation between economic causes and the economic consequences of emergency situations. And there are far more such facts than expected by the authors. Therefore, there is a clear need to determine the correlation between the economic causes and the consequences of emergency situations, especially in the context of limited actions in the prevention of emergency situations due to lack of funds.

Problem statement

Purpose – to elucidate the «economic nature» of an emergencies, to expand the list of reasons for the formation and consequences of the emergencies, taking into account the economic component, and to provide a description of their interrelation in this process.

Methods and Data

This paper includes methods, in particular, of general sciences: induction, deduction, analysis, synthesis, scientific abstraction and generalizations - for the formation, substantiation and development of the formalized conceptual-categorical apparatus of the research; a comparative analysis, a theoretical generalization of a causal correlation - to determine the differences between the causes of the occurrence and the consequences of emergency situations' demonstration; a system approach - for the development and substantiation of fan matrices system making; specific: semantic analysis - for analyzing the flow of publications to determine the methodological basis for determining the economic causes and consequences of emergency situations; processing expert information - to determine the key factors for fan matrices; project priority - for making fan matrices and the formation of conclusions based upon them. Information sources of research are the scientific papers of local and foreign scientists on the problems of assessment and management of emergency situations, regulatory documents and the legislative framework of Ukraine and other countries on the classification of emergency situations.

The distinction between the social and purely economic causes of emergency situations and the relation establishment between the types of emergency situations are identified in the Code of Civil Protection of Ukraine (Kodeks tsyvilnoho zakhystu Ukrainy, 2018), with the aid of a new feature, was carried out by a fan matrix (the Kordonskyi Matrix) (Kordonskyi, 2011).

"Fan matrix is a table used in methodology, semiotics, classification theory to describe taxonomies and ontologies" (Veyernaya matritsa, 2018). Its essence lies in the fact that such a matrix has a "level structure", that is, it allows the information in the form of a certain set of levels (by structure, management or functioning), allows considering each concept as the level of organization from the derivative of the fan matrix. In addition, the fan matrices are substantially limited, since the scope of their interpretation can not go beyond the limits defined by previous levels (organization, structure, management, operation). The fan matrices allow building ontologies of scientific pictures of the world; to predict the existence of concepts (objects, phenomena) and relations between levels of research; generate partial picture of the world, based on the basic picture of the world; to simulate (to set character sets) structures of different levels, to operatively

represent (solve) the so-called paradoxes of belonging. "Fan matrix is in the fact that its fragments, taken according to certain rules, unfold in derivatives from the original table of structure, which preserve its logic" (*Veyernaya matritsa*, 2018).

Results and discussion

An "Emergency Law" adopted in the United Kingdom defines an emergency situation as depriving a society of sources of vital needs and requiring special actions and opportunities (*Civil Contingencies Act*, 2004). This definition should meet the challenges, risks and threats faced by each state in the new millennium.

Based on the already existing definitions of military and man-made emergency situations (*Nadzvychna sytuatsiia*, 2018), under an emergency situation of an economic nature (economic emergency), we consider the situation as a result of the government's false economic actions, the use of economic sanctions by other countries, hybrid hostilities, inflation, impoverishment population and loss of savings, unemployment and bankruptcy of enterprises and organizations, investors outflow, depreciation of the national currency and securities.

To identify the economic nature, causes and consequences of emergency situations associated with economic factors, the authors of this paper have studied the emergency situations classification.

Classification is not only important for science, but is also one of the main components of thinking.

Separate results of the researches of emergency situations classification are presented in the papers of G. M. Kharamda (*Kharamda*, 2012), V. C. Zhidetsky (*Zhidetsky, Dzhyhyrey, & Melnykov*, 1999), V. S. Dzhigireya (*Dzhyhyrey, & Zhidetsky*, 2000), V. E. Goncharuk, S. I. Kachana, S. M. Orel and V. I. Putsylo (*Goncharuk, Kachan, Orel, & Putsylo*, 2004), Ya. O. Sierikov (*Sierikov*, 2007), D. Yu. Polkovnychenko (*Polkovnychenko*, 2014), D. Mladan and V. Cvetković (*Mladan, & Cvetković*, 2010) and many other authors.

G. M. Kharamda (*Kharamda*, 2012) proposes a classification of the emergency situations causes, which also highlights economic ones. Among such causes, he defined: "imperfection of technical means and technological processes, environmental change due to nature use (pollution, exhaustion of resources), poverty (wearing equipment, lack of funds for modernization, prevention)" (*Fig. 1*). However, this interpretation, in our opinion, is incomplete and controversial.

D. Yu. Polkovnychenko (*Polkovnychenko*, 2014) identified two groups of contradictions: "between nature and society and within society." In turn, in the latter group of contradictions, that is, within the society, it is possible to conditionally identify a set of socio-political, including military-political and socio-economic contradictions, on two levels: interstate (international) and in-state. " However, in the general author's definition of emergency situations, he does not distinguish economic causes: "Using such grouping and considering emergency situations as a consequence of the contradictions intensification in the absence or lack of effectiveness of the mechanism for managing the development of society, we can distinguish four classes of emergency situations: military-political and social-political conflicts; natural disasters; man-made disasters; emergency situations of the "combined type", that is, those with a mixed natural-technological (epidemic of oncological diseases, lung silicosis, etc., as well as landslides, desolations, etc.), natural-social (some mental illness) nature. "

D. Mladan and V. Cvetković (*Mladan&Cvetković*, 2010) proposed another approach to classification - the ability to manage emergency situations through means of prediction and influence (*Table 1*). However, this classification is not based directly on economic rather than on purely managerial actions.

The emergency situations in the world get classified and are at the legislative level, depending on the causes, scales, consequences, etc. Depending on the geographical location, the peculiarities of the legislation or customs of each country, inherent features of such classification (*Emergency*, 2018).

For example, in the UK, the types of emergency situations are distinguished according to the facility, which includes emergency situations: emergency situations that threaten life, health, property or the environment (*Emergency*, 2018).

Similar to British, there is the Chinese emergency situations classification, but unlike Britain, only three factors are taken into account: depending on the threats to life, health and the environment. According to the law, life threatening is considered to be an emergency situation with the highest priority, because "nothing is more important than human life" (*Jinji qingkuang*, 2018).

In the United States, there is no single federal classification. The type of emergency situations is different for each state, where local authorities manage emergency situations. For example, in Texas, emergency situations are classified into 4 levels depending on the impact degree (supervised by specialist personnel; uncontrolled, but occurring on small territory; an uncontrolled situation requiring an additional protection zone; a completely uncontrolled situation) (*Emergency Classification Levels & Responsibilities*, 2018).

In view of the significant upheavals in recent history of Serbia (military actions, significant population displacement) in that country, the criteria for emergency situations classification are: time (unexpectedness, rate of cases' development); social and ecological consequences (human sacrifices, epidemics, mass destruction of cattle, preparation of production, use of a significant amount of natural resources); social and economic consequences (big conflict, high risk, provoking internal political instability, domestic political cases, increasing inter-ethnic tensions, expressed international instability, economic consequences (significant economic losses and the threat to financial and material resources, violations of the regular transport system, the need for significant material costs and compensations, the formation of funds, the need to use a large number of methods to prevent situations and eliminate the consequences); the body Management (Unpredictable Situations in Management) (*Ванредна ситуација*, 2018).

Despite single emergency management body in the EU, the European Center for Monitoring and Information on Emergency situations, there is still no single emergency situations classification in the EU. For different countries, the classification varies.

In Germany, emergency situations are classified according to the principle of responsibility for resolving the situation, due to the fact that there are a large number of services in this country (civilian, military, and even volunteer) who should come to the rescue in case of emergency. In addition, the country's government distinguishes such groups of emergency situations as: general emergency situations for health, fires, accidents or water saving with a message by telephone 112; general emergency situations in other threats and accidents with police reports by telephone 110 or using the emergency call system 734; Emergency situations in the Alps with the alert of the mining rescue service; dangerous cases in railway transport with the notification of the emergency manager of DeutscheBahn, accidents in mines, emergency situations in underground caverns and caves; other disaster cases with notifications of it (*Notfall*, 2018).

A simpler classification of emergency situations is used in Finland: criminal offenses, natural disasters (fires, marine accidents, earthquakes, floods, tornadoes, tsunamis, volcano eruptions), man-made disasters (structures collapse through fires, explosions (terrorism) or bad design, air crashes, car accidents), administrative emergency situations (terrorism, war) (*Pelastustoiminta*, 2018). In the Czech Republic a multilevel classification of emergency situations is used, which classification types are given in *Table 2*.

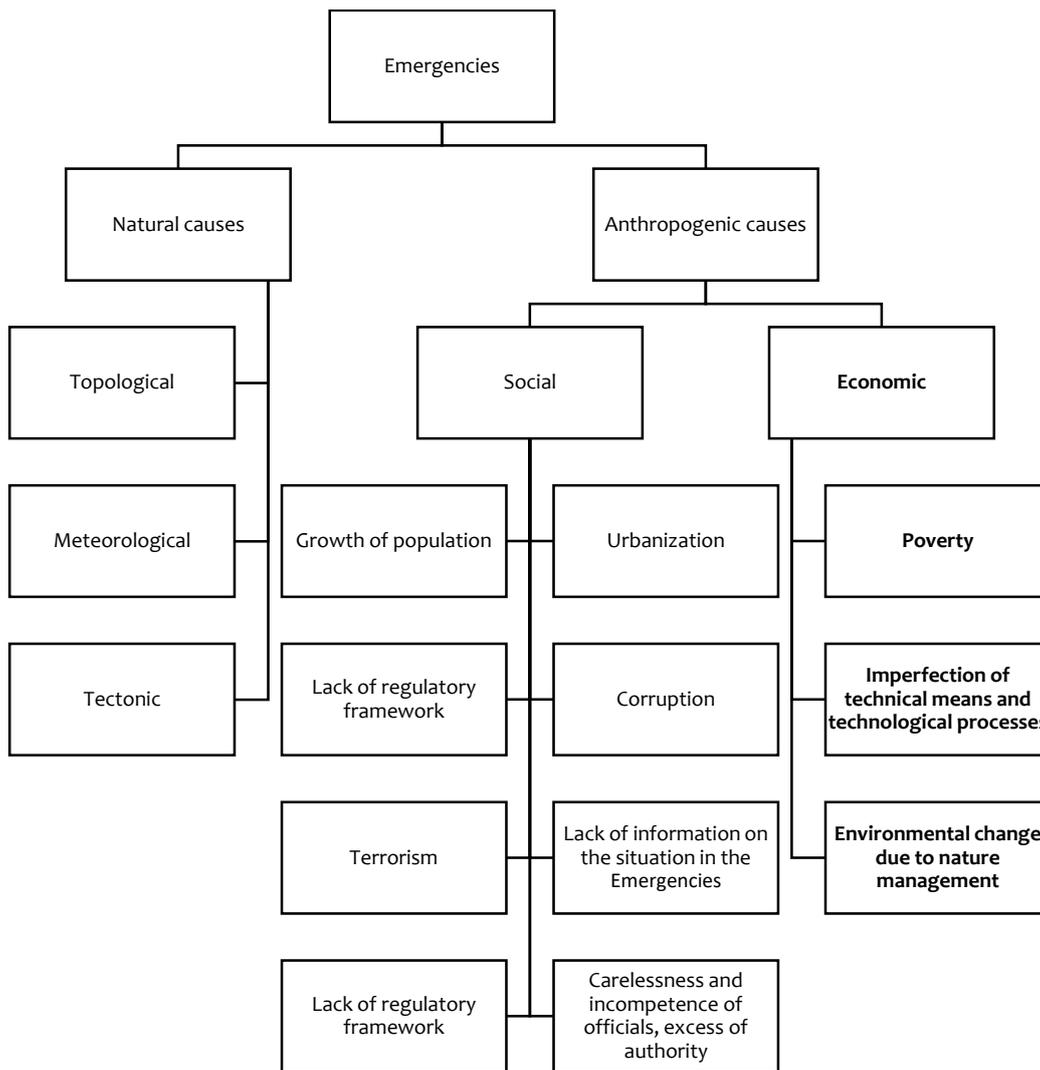


Fig. 1. Classification of the causes of emergencies by G.M. Haramda (Kharamda, 2012)

Emergencies classification, presented in the work of D. Mladan and V. Tsvetkovich

Table 1

Ability to predict	Possibility of influence on the ES	
	Controlled	Uncontrolled
Predictable	Traditional emergencies	Uncontrolled emergencies
Unpredictable	Unexpected emergencies	Unpredictable emergencies

Source: made on the basis of (Mladan & Cvetković , 2010).

Emergencies types in the Czech Republic

Table 2

Cases caused by natural phenomena	
local (flood, earthquake)	abiotic (storms, fires caused by natural phenomena)
global (e.g., super misfortune, pandemic)	biotic (epidemic, pest infestation)
extraordinary events caused by a person	
unintentional (technical failure, accident, negligence)	military (military attack of another state)
intentional (sabotage, terrorism, war)	non-war (unrest, social or economic reasons)
Emergency situations with mixed cause	

Source: made on the basis of (Mimořádná událost, 2018).

In Ukraine, the types of emergency situations are defined in the Code of Civil Protection of Ukraine (Kodeks tsyvilnoho zakhystu Ukrayiny, 2018) and the Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Classifying Emergency situations by their Levels" (Postanova Kabinetu Ministriv Ukrayiny, 2013), which distinguish four main types of emergency situations depending on the emergency consequences (Kodeks tsyvilnoho

zakhystu Ukrayiny, 2018) or territorial spreading (Postanova Kabinetu Ministriv Ukrayiny, 2013) (state, regional, local, object) and 4 main causes depending on the nature origin of cases that may lead to their occurrence (man-made disasters, natural disasters, social, military) (Kodeks tsyvilnoho zakhystu Ukrayiny, 2018).

At the same time, in the modern world, the fifth cause of emergency situations is becoming more and more significant - economic. After all, the sources of information show that inflation (for example, in Venezuela 2017-2018), the population impoverishment through financial pyramids (e.g., in Albania in the 1990's), depreciation or loss of savings (Russia, 1993), own miscalculations of government officials or false economic development strategies (Chile, 1973), hybrid economic challenges of neighboring countries (sanctions, boycotts, blockades, embargoes, etc.) (Libya, 2009-2011) can also be a source of emergency situations.

The causes of emergency situations are not always clear and often coincide (Spiegel, Le, Ververs, & Salama, 2007). For example, A. Sen (1999) argued that hunger is usually caused by a lack of purchasing power, but not necessarily by drought or as a consequence of a food shortage. But these factors can aggravate the low level of the population solvency (Sen, 1999; Spiegel, Le, Ververs, & Salama, 2007).

In many cases, effective response, impact and management of emergency situations prevention, emergency operations, and emergency response minimization are only possible with appropriate economic support for such processes, which differences in economic costs depend on the emergency situations

type. Depending on the emergency situations type, the economic costs of processes associated with them may vary.

However, from our point of view, in all these papers insufficient attention is paid to the study of the emergency situations nature, including their "economic nature", because:

- 1) the economic causes of the emergency situations are not clearly defined or included as social (social and political);
- 2) not all factors that may trigger emergency situations due to economic reasons are identified;
- 3) there are not clearly defined consequences of emergency situations, which, in their turn, can have both economic reasons and economic demonstration.

For a clearer delineation of social and purely economic causes for emergency situations, the authors attempted to relation those with all types of emergency situations (involving a new feature), defined by the Code of Civil Protection of Ukraine (Kodeks tsyvilnoho zakhystu Ukrayiny, 2018), by a fan matrix (the matrix of S. Kordonskyi) (Kordonskyi, 2011).

Such a matrix, proposed from the research perspective, is presented in Table 3.

Table 3

Emergencies types under the Civil Protection Code of Ukraine and the Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Classifying Emergencies by Their Levels"

By nature of origin (cause)	Territorial spreading			
	state level	regional level	local level	object level
economic (new feature)	+			
military	+	+		
social	+	+	+	
natural nature	+	+	+	+
man-made nature (technogenic nature)	+	+	+	+

Source: generated by the authors.

The matrix depicts a clear distinction between "economic" and "social" causes of emergency situations. Economic causes are a case of the state level, since their consequences will affect all citizens of the country, and the social cause of the occurrence can trigger an emergency situation in the territorial spreading of not only the state but also of the lower level - regional, local, or even object.

An example of such emergency situations in the world can be considered as follows:

- 1) Ulster crisis - social (more precisely, social and political), conflict of Catholics and Protestants in Northern Ireland (part of Great Britain) - regional level (*The Troubles, 2018*);
- 2) genocide of Tutsi nationality in Rwanda - social, but with the whole country's level spreading (*Rwandan genocide, 2018*);
- 3) the population impoverishment and power change in Libya (as a consequence of sanctions against the regime of Muammar Gaddafi) - economic cause (*Muammar Gaddafi, 2018*);
- 4) constant riots with human victims in the face of significant inflation in Venezuela due to the economic strategy of the country's government, the economic cause (*Economy of Venezuela, 2018*).

When conducting classifications of emergency situations, some scientists suggest taking these signs into account (Bereziuk, &

Lemeshev, 2011): "The general cause of occurrence, demonstration type, scope, consequences, timing and scale of occurrence."

Of particular interest is the category of "consequences" that results in occurrence of new emergency situations. Traditionally, the consequences of demonstration of emergency situations include technogenic, social and political, environmental, and economic (Bedriy et al., 1997). However, V.P. Kniazeva, N.S. Scanavy and T.V. Averchenko (Kniazeva, Scanavy, & Averchenko, 2002) also distinguish those as the ones that can be called historical. Historical consequences of emergency situations should be considered as leading to the decline and looting or distortion of cultural and historical heritage (destruction of architectural objects, loss of religious or cultural values, etc.).

At the same time, the economic consequences of emergency situations should be considered such that lead to direct material losses of the state, economic entities, communities, population.

The economic consequences can be resulted in cases of all consideration levels of emergency situations: state, regional, local, and even object due to the fact that at each level the case requires direct funds spending to eliminate it, it causes certain direct losses. At the same time, the expenditure amount depends precisely on the level of emergency situations (Table 4).

Table 4

The correlation matrix between the types of emergencies on the result of their demonstration and on the territorial of spreading

As a consequence of demonstration	Territorial spreading			
	state level	regional level	local level	object level
historical	+			
social and political	+	+		
man-made (technogenic)	+	+	+	
ecological	+	+	+	+
economic	+	+	+	+

Source: generated by the authors.

At the same time, we believe that the historical consequences of emergency situations can only be at the state level, since cultural heritage is the gain of all people and the whole state, because they are kept in state museums, are protected by the state, and some objects of cultural heritage are even recognized as the property of world civilization (*Cultural heritage, 2018*).

The expediency justification of the category on historical and economic consequences of the emergency situations can also be disclosed by the fan matrix, shown in the Table. 5, - a combination of emergency situations types as a consequence of their demonstration and types of necessary expenses.

Table 5

The emergencies types by the consequences of their manifestation and types of necessary expenses

As a consequence of demonstration	Types of necessary expenses			
	on insurance from the onset of a case	to cover direct damage from the case	for prevention (except for insurance)	for elimination of consequences
historical	+	+		
social and political	+	+	+	
man-made (technogenic)	+	+	+	+
ecological	+	+	+	+
economic	+	+	+	+

Source: generated by the authors.

So, from the economic point of view, the historical consequences of emergency situations are only direct losses, and it is almost impossible to determine the costs of preventing or eliminating the consequences. However, one can insure historical objects of cultural heritage for their (possibly partial) restoration. Although the newly constructed object will only be a copy of the historical, and the object of cultural heritage will be lost (as, for instance, St. Michael's golden-domed cathedral in Kiev). Instead, the economic consequences of emergency situations are not only a direct economic loss (e.g., savings depreciation) but can also be insured (by converting part of funds into other currencies or liquid assets). In addition, funds can be used to prevent the economic consequences of emergency situations (currency interventions on the interbank exchange to stabilize the national currency) and their elimination (subsidies, material assistance to the population, and subventions to local budgets).

The economic consequences of emergency situations are manifest in their demonstration. At the same time, one and the same problem may require a long time to solve, and can be solved

instantly. For instance, the steady growth of foreign exchange rate during 2014 in Ukraine was not quickly stopped by the government. Opposite panic in the currency market at the end of December 2018 was resolved in a few days. However, in our opinion, it is more interesting to combine by the fan matrix the classification of emergency situations "for the causes of occurrence" and "the consequences of their demonstration" and emerging (Table 6) the cause-effect correlation.

From the philosophical point of view, the "cause" and "consequence" categories generalize and distinguish one of the concrete and specific forms of such correlation. So, every phenomenon or group of interacting phenomena generates other phenomena. At the same time, the phenomenon that causes other phenomena to life, serves as a cause. In turn, the cause itself generates a consequence, because "the cause is a phenomenon, the thing that directly causes, generates another phenomenon, which is called a consequence" (*Nadolnyi, 1997*). Hence, there is a certain chain of cause-and-effect correlations between certain previously identified groups of emergency situations.

Table 6

The matrix of cause-and-effect correlation between types of emergency situations classified according to the causes of origin and the consequences of demonstration

As a consequence of demonstration	For cause of origin				
	military	social	man-made nature (technogenic nature)	natural nature	economic
historical	+	-	-	-	-
social and political	+	+	-	-	-
man-made (technogenic)	+	+	+	-	-
ecological	+	+	+	+	-
economic ones	+	+	+	+	+

Source: generated by the authors.

This combination allowed determining the direct and indirect effects of each cause of emergency situations on corresponding effects of demonstration. After all, the causes of maritime emergency situations (military emergency situations) can have only direct consequences: historical (destruction of cultural values), social and political (revolution), man-made (destruction of industrial objects), environmental (environmental pollution) and economic (inflation, population impoverishment due to the loss of property).

At the same time, the economic causes of emergency situations directly affect only the economic consequences (inflation - the population impoverishment), and their impact on remaining consequences is indirect, due to the impact of other factors-consequences. For example, due to the depopulation (economic cause), mass disorder begins (social and economic crisis) and robbery and destruction of cultural heritage objects (historical consequences). Or due to the population impoverishment (economic cause) there is a shortage of funds for education (social

and economic crisis), which causes technological, historical or environmental consequences of emergency situations. Direct effect in tabl. 4 is marked with "+", and the side one is marked with "-".

It should also be noted that the direct impact of emergency situations can cause not only negative but also (in some cases) positive effects (including in economic terms). For example, the change of tyranny by democracy as a result of revolution, the destruction of an environmentally harmful objects due to military actions, etc. While side effects have only negative consequences (e.g., the destruction of historical objects, trade facilities or property of people through mass riots, caused in turn by rising fuel prices in Paris in the fall of 2018).

Separating the economic component in emergency situations and informing the public hereof allows realizing economic risks, and this affects the decision-making and behavior of people.

The economic consequences of emergency situations are decisive in assessing such a macroeconomic indicator as the capacity of the state. After all, the capacity of the state should be evaluated, firstly, from the point of view of solving the main task of systemic transformations - deepening the market transformation of the economy and preventing the economic causes of emergency situations (Trush, & Litvinenko, 2008). The determinants of this process are the institutional provision of policy reforms, the completion of the process of forming a ramified market infrastructure, the establishment of an effective legislative field and stable rules of economic activity. Another problem is sharply eliminated - elimination of existing deformations in property relations, ensuring legalization of its main forms, political support and reliable state protection of private property, interests of business partners and lenders, national capital in general, since property issues often appear to be the main stimulus of popular discontent and occurrence of emergency situations (e.g. example, the crisis of car owners on a foreign registration). The state should actively interfere in this process, to assume the main burden of responsibility for its results. It is, in the end, about the formation of the necessary critical mass of reforms in the short term, which will allow the Ukrainian economy to develop in the long run on a self-sufficient market basis.

Secondly, the state's capacity should be assessed also from the point of view of its ability to provide (with all available tools, including regulatory means) the creation of economic, political and social preconditions for realization of existing (and potential) competitive advantages of the Ukrainian economy. In a situation where such advantages can not be realized on the basis of market self-regulators due to their absence, the state should act as an entity that strengthens the emerging market mechanisms to refine what the market is not able to do at the moment itself. By such steps the state can create new economic causes of emergency situations.

Thirdly, the competitive advantages realization must be realized in strengthening position of domestic market, the establishment of an innovative model for the development of the Ukrainian economy, energy saving mechanisms and structural policies, and overcoming the accumulated over the years of independence of reproductive deformations, because a stable internal market ensures elimination of both social and economic causes of emergency situations.

Fourthly, it requires reconsideration of the macroeconomic stabilization logic. It is also one of the determining factors of the state's capacity to act. In previous years, the macroeconomic stabilization rate was applied to monetary policy. However, Ukraine's own experience, as well as the experience of other post-socialist countries, demonstrates limited ability of reliable stabilization of money purely by monetary instruments. Increasingly, the social and even psychological factors contribute to the stabilization of the course of the domestic currency exchange rate.

Fifthly, strengthening of the state effectiveness is associated with a significant increase in its impact on the development of the social sphere. The basis of this is the reliable protection and state support for socially unprotected sections of population, as the main driving forces for social and economic causes of emergency situations.

Conclusions

The analysis of previous research on emergency situations revealed a limited focus on the economic issue. This paper proposes to identify the economic component in management of emergency prevention and emergency situations in order to minimize the negative consequences. The examples proved that the economic nature of all processes preceding emergency situations, actions in emergency situations limited to the economic factor, emergency situations can have economic consequences. An economic component can be both a cause and a consequence of emergency situations. At the same time, the

economic causes of emergency situations directly affect only the economic consequences (inflation - population impoverishment), and their impact on remaining consequences - indirect, due to the impact of other factors-consequences.

The practical significance of the research's results is that the isolation and systematization of the economic component of emergency situations allows considering economic factor in the development of appropriate prevention algorithms, actions in emergency situations or actions to eliminate the negative effects of such cases, to improve approaches to assessment of economic indicators of emergency situations with a focus on causal relation between economic costs, preceding emergency situations (costs of emergency situations prevention), economic costs of eliminating emergency situations and economic consequences of emergency situations (losses or costs of eliminating consequences of emergency situations) in the emergency management. All this will help ensure a comprehensive and coordinated response to the emergency situations.

The value of this research's results is that with the isolation of economic component of emergency situations, further development of methodological approaches to the emergency situations types classification. In the emergency situations types classification on the basis of "causes of occurrence," the authors proposed to consider the group of factors of the emergency situations occurrence - economic circumstances, and in types of emergency situations, classified by the "emergency response" - considering the groups - economic and historical. This grouping, unlike the existing one, allows focusing on the economic problems associated with emergency situations and to take into account the economic component in development of management decisions to prevent, eliminate, and minimize the consequences.

The results of the research can be applied at different government levels from the state to the object during the formation of policy and planning of economic costs for the emergency situations' prevention, actions during emergency situations and to reduce or eliminate negative effects of such cases.

References

- Bedriy, Ya.I., Dzhyhyrey, V.S., Kydysyuk, A.I., Ohrynskyi, P.I. et al. (1997). *Bezpeka zhyttyedyial'nosti. Navchal'nyy posibnyk [Safety of life. Teaching manual]*, Afisha, Lviv, Ukraine (in Ukrainian).
- Berezniuk, O.V. & Lemeshev, M.S. (2011). *Bezpeka zhyttyedyial'nosti [Life Safety]*, VNTU, Vinnitsa, Ukraine (in Ukrainian).
- Bublyk, M.I. & Koropetska, T.O. (2012). *Otsynuyvannya tekhnohennykh zbytkiv promyslovykh pidpryemstv v umovakh formuvannya evolyutsiynoyi ekonomiky [Estimation of technogenic losses of industrial enterprises in the conditions of evolutionary economy formation]*. *Visnyk NU «Lviv'ska politekhnika»*. *Problemy ekonomiky ta upravlinnya [Bulletin of the National University "Lviv Polytechnic". Problems of Economics and Management]*, 725, 32-41 (in Ukrainian).
- Civil Contingencies Act (2004): A Short Guide, Cabinet Office, Civil Contingencies Secretariat, London, 2-3.
- Cultural heritage (2018). Available at: https://en.wikipedia.org/wiki/Cultural_heritage.
- Dzhyhyrey, V.S. & Zhidetsky, V. Ts. (2000). *Bezpeka zhyttyedyial'nosti. Navchal'nyy posibnyk [Life Safety. Teaching manual]*, Afisha, Lviv, Ukraine (in Ukrainian).
- Economy of Venezuela (2018). Available at: https://en.wikipedia.org/wiki/Economy_of_Venezuela.
- Emergency (2018). Available at: <https://en.wikipedia.org/wiki/Emergency>.

- Emergency Classification Levels & Responsibilities (2018). Available at: <https://www.ci.la-marque.tx.us/176/Emergency-Classification-Levels-Responsi>.
- Goncharuk, V.E., Kachan, S.I., Orel, S.M. & Putsylo, V.I. (2004) Otsinka obstanovky u nadzvychaynykh sytuatsiyakh. Navchal'nyy posibnyk [Assessment of the situation in emergencies. Teaching manual], Vydavnytstvo NU «Lvivska politehnika», Lviv, Ukraine (in Ukrainian).
- Hrytsyshen, D.O. & Polyak K.Yu. (2016). Suchasnyy stan oblikovo-analitychnoyi systemy upravlinnya hospodars'koyu diyal'nistyu v umovakh nadzvychaynykh sytuatsiy [The current state of the accounting and analytical system of management of economic activity in the conditions of emergency situations], *Visnyk ZHDTU. Seriya: ekonomichni nauky [Bulletin of the ZhDTU. Series: Economic Sciences]*, 4 (78), 61-75 (in Ukrainian).
- Jansen, M. (2010). Startseite des Studiengangs Katastrophenvorsorge und -management. Available at: www.kavoma.de (in German).
- Jǐnjí qǐngkuàng (2018). Available at: <https://zh.wikipedia.org/wiki/紧急情况> (in Chinese).
- Kharamda, G .M. (2012). Tsyvilnyi zakhyst: Navchalnyi posibnyk [Civil Protection: Teaching manual], NTU, Kyiv, Ukraine (in Ukrainian).
- Khlobystov, Ye.V., Zharova, L.V. & Voloshyn, S.M. (2009). Metodychni pidkhody do otsinky naslidkiv nadzvychaynykh sytuatsiy: porivnyal'nyy analiz ukrayins'koyi ta mizhnarodnykh praktyk [Methodological approaches to the assessment of the consequences of emergencies: a comparative analysis of Ukrainian and international practices]. *Mekhanizm rehulyuvannya ekonomiky [Mechanism of economy regulation]*, 4, 1, 24-33 (in Ukrainian).
- Kniazeva, V.P., Scanavy, N.S. & Averchenko, T.V. (2002). Okhrana okruzhaiushchei sriedy [Environmental protection], Logos - Razvitiie , Moscow, Russia (in Russian).
- Kodeks tsyvilnoho zakhystu Ukrayiny [The Code of Civil Protection of Ukraine] (2018). Available at: <http://zakon3.rada.gov.ua/laws/show/5403-17>.
- Kordonskiy, S. (2011). Veyernyye matritsy kak instrument postroyeniya ontologiy [Fan matrices as an ontology construction tool]. South-East Publishing House, Washington, USA (in Russian).
- McElreath, D., Doss, D., Jensen, C., Wigginton, M., Nations, R., Van Slyke, J. & Nations, J. (2014). Foundations of Emergency Management (1st ed.). Kendall-Hunt Publishing Company, Dubuque, IA, USA.
- Mimořádná událost (2018). Available at: https://cs.wikipedia.org/wiki/Mimořádná_událost (in Czech).
- Mimura, N., Yasuhara, K., Kawagoe, S., Yokoki, H., & Kazama, S. (2011). Damage from the Great East Japan Earthquake and Tsunami - A quick report. *Mitigation and Adaptation Strategies for Global Change*, 16(7), 803–818. doi:10.1007/s11027-011-9297-7. (<https://link.springer.com/article/10.1007/s11027-011-9297-7#citeas>).
- Mladan, D. & Cvetković, V. (2010). Classification of Emergency Situations. Available at: https://www.academia.edu/11135696/CLASSIFICATION_OF_EMERGENCY_SITUATIONS.
- Mogylnichenko, V.V. (2008). Zakhyst naselennya i terytoriy vid nadzvychaynykh sytuatsiy. T. 3. Inzhenerno-tehnichni zakhody tsyvilnoho zakhystu (tsyvil'noyi oborony) ta mistobuduvannya [Protection of the population and territories from emergency situations. T. 3. Engineering and technical measures of civil defense (civil defense) and urban planning], KIM, Kyiv, Ukraine (in Ukrainian).
- Muammar Gaddafi (2018). Available at: https://en.wikipedia.org/wiki/Muammar_Gaddafi.
- Nadolnyi, I.F. (1997). Filosofiya. Navchalnyi posibnyk [Philosophy. Teaching manual], Vikar, Kyiv, Ukraine (in Ukrainian).
- Nadzvychaina sytuatsiia [Emergency] (2018). Available at: https://uk.wikipedia.org/wiki/Надзвичайна_ситуація (in Ukrainian)
- Notfall (2018). Available at: <https://de.wikipedia.org/wiki/Notfall> (in German).
- Opanasiuk, Yu.A. & Melnyk, Yu.M. (2013). Metodychni pryntsyipy otsinky ekoloho-ekonomichnoho zbytku vid nadzvychaynykh sytuatsiy [Methodical principles of estimation of ecological and economic damage from emergency situations]. *Ekonomika i upravlenie [Economics and Management]*, 5, 63 (in Ukrainian).
- Pelastustoiminta (2018). Available at: <https://fi.wikipedia.org/wiki/Pelastustoiminta> (in Finnish).
- Ploskonos, G.M. (2003) Kontseptual'ni pidkhody shhodo formuvannya mekhanizmiv minimizatsiyi ekonomichnykh naslidkiv avaryi i katastrof [Conceptual approaches to the formation of mechanisms for minimizing the economic consequences of accidents and disasters]. *Problemy informatyzatsiyi ta upravlinnya: Zbirnyk naukovykh prats [Problems of informatization and management: Collection of scientific works]*, 8, 94-98 (in Ukrainian).
- Polkovnychenko, D.Yu. (2014) Klyasifikatsiya nadzvychaynykh sytuatsiy: derzhavno- upravlinskyi pidkhid [Classification of Emergencies: Public Management Approach]. *Teoriya ta praktyka derzhavnoho upravlinnya [Theory and Practice of Public Administration]*, 1, 350-356 (in Ukrainian)
- Postanova Kabinetu Ministriv Ukrayiny «Pro zatverdzhennya Poryadku klyasifikatsiyi nadzvychaynykh sytuatsiy za yikh rivnyamy» [Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Classifying Emergencies by Their Levels"] (2013). Available at: <http://zakon.rada.gov.ua/laws/show/368-2004-n> (in Ukrainian).
- Rwandan genocide (2018). Available at: https://en.wikipedia.org/wiki/Rwandan_genocide.
- Sen, A. (1999). Development as freedom. New York, Random House.
- Sierikov, Ya.O. (2007). Osnovy okhorony pratsi. Navchalnyi posibnyk [Fundamentals of Labour Safety. Teaching manual], KHNAMH, Kharkiv, Ukraine (in Ukrainian).
- Spiegel, P. B., Le, P., Ververs, M.-T., & Salama, P. (2007). Occurrence and overlap of natural disasters, complex emergencies and epidemics during the past decade (1995–2004). *Conflict and Health*, 1(1). doi:10.1186/1752-1505-1-2. <https://conflictandhealth.biomedcentral.com/articles/10.1186/1752-1505-1-2>.
- The Troubles (2018). Available at: https://en.wikipedia.org/wiki/The_Troubles
- Trainor, J.E. & Subbio T. (2014). Issues in Disaster Science and Management: A Critical Dialogue. Federal Emergency Management Agency Higher Education Program; Emmitsburg, MD, USA.
- Trush, O.O. & Litvinenko, I.V. (2008). Modernizatsiya ukrayinskoyi ekonomiky v umovakh hlobalizatsiyi [Modernization of Ukrainian economy in globalization conditions] . *Derzhavne budivnytstvo [Public Administration]*, 1 . (in Ukrainian) Available at: <http://www.kbuapa.kharkov.ua/e-book/db/2008-1/doc/5/09.pdf>.
- Vasiichuk, V.O., Goncharuk, V.E., Kachan, S.I., & Mokhnyak, S.M. (2010). Osnovy tsyvilnoho zakhystu: Navch. posibnyk

[Fundamentals of Civil Protection: Teaching manual], National University "Lviv Polytechnic", Lviv, Ukraine (in Ukrainian).

Veyernaya matritsa [Fan matrix] (2018). Available at: https://ru.wikipedia.org/wiki/Векерная_матрица (in Russian).

Yevdokymov, V.V., Hrytsyshen, D.O. & Polyak, K.Yu. (2016). Informatsiyana model upravlinnya hospodarskoyu diyalnistyu v umovakh nadzvychnykh sytuatsiy: monohrafiya [Information model of management of economic activity in emergency situations: monograph], ZhDTU, Zhytomyr, Ukraine (in Ukrainian).

Zhidetsky, V. Ts., Dzhyhyrey, V.S. & Melnykov, O.V. (1999). Osnovy okhorony pratsi [Fundamentals of labor protection], Afisha, Lviv, Ukraine (in Ukrainian).

Zhou, Q., Huang, W., & Zhang, Y. (2011). Identifying critical success factors in emergency management using a fuzzy DEMATEL method. Safety science, 49(2), 243–252. , doi: 10.1016/j.ssci.2010.08.005.

Ванредна ситуација (2018). Available at: https://sr.wikipedia.org/wiki/Ванредна_ситуација (in Serbian).



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