



DISASTERS AND THE BUSINESS (ECONOMY): LESSONS AND ACTIONS

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Abstract

The purpose of this article is to analyze the economic and social consequences of the interaction between the business (economy) and disasters worldwide. It establishes the presence of reciprocal cause-effect relationship between the two, and its impact on the operation of society-nature system. Emphasis is made on the need to ensure business stability in case of an emergency. The analysis also outlines the prospects for the business in view of predicted disaster situations in the near future.

Key words: disastrous situations, society, events, effects, management

INTRODUCTION

In March of 2011 an Earthquake measuring 9 on the Richter scale, the resulting tsunami and explosion in the Fukushima nuclear power plant devastated the Pacific coast of Japan, the third largest economy in the world.

According to the European Commission the number of disasters worldwide has increased fivefold since 1975. The economic and social consequences of disasters caused by spontaneous natural disasters or those induced from human activity have severely escalated. Each year, 85,000 people die and 230 million are affected by disasters. The economic cost is also enormous - a quarter of a percent of global gross domestic product per year (1). This indicates the presence of a continuous trend, and its significant impact on all spheres of society. Economic sphere of society, its reproduction and development is provided by economic organizations.

The purpose of this article is to analyze the disasters from a business perspective and to

identify opportunities for their mitigation. Sociological approach is used to detect regularities in the functioning of the system society - nature and its subsystems.

Reasons for disaster states and their consequences

Disasters are unforeseen events that lead to disruption of normal business operations of an organization with the potential to cause sudden and serious adverse effects. The World Health Organization disasters are divided into two groups - of natural origin and related to human activities. For the purposes of this analysis, the business is seen as a general term for the business units most affected by the disaster areas of the economy (industry, trade, tourism, agriculture, etc.). Each business unit is a separate organization with internal business environment that is operational and under the influence of external factors (business and market environment and global environment).

Spontaneous natural disasters such as earthquakes, tsunamis, floods, sudden temperature changes, fire, etc. are characterized by abruptness. The largest natural disasters in 2010 were the earthquake in Haiti and the flooding in Pakistan. In March 2011 an earthquake in Japan lead to a radiation emergency with long-term consequences.

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Another group of disasters are caused by the functioning of the business. Such man-made disasters are major industrial accidents, radiological accidents, transport accidents and others. Such examples in 2010 are the the Gulf of Mexico oil spill and the toxic spill at an aluminum plant in Hungary. In the spring of 2011, accidents in three nuclear power plants in Japan caused the worst nuclear accident in 25 years.

There is a similarity in the effects of disasters, regardless of their origin (natural, anthropogenic or a combination of the two). The effects on business are a consequence of direct effects of the disaster on the individual business unit, and the effect of the disaster on the society and the business environment. For the purposes of this analysis the impact of disasters can be traced to several interrelated levels: business unit, business environment, society, nature.

Direct damage to the business results from the damage to buildings, roads and other infrastructure. The impairment of the IT infrastructure of individual business units is particularly negative. Every company relies on its IT infrastructure, computers and software applications to operate its business. In any organization, benefiting from relatively developed IT infrastructure, disasters lead to the following damage:

- losses associated with recovering information;
- losses associated with recovering the productivity of the systems;
- losses due to damage of the image of the company;
- losses due to the inability to recover valuable information and more.

For an Eastern European Bank of medium size, the financial loss from having the information system down for a day is approximately US \$ 200 000 and that from a one-minute interruption costs the bank US \$ 7 thousand (2). In an emergency every company is in danger of disrupting its activity for a shorter or longer period of time, leading to losses.

Disasters affect the economy in varying degrees and with varying duration, depending on the scale of the disaster. Not only do disasters cause material damage but they affect the life and work ability of personnel as well as the rest of the population. The devastating

earthquake, tsunami and radiation accident in Japan in March 2011 destroyed a large number of industries along the coast, thus affecting the economic activity in many sectors, the economy of the country and the global economy. The Ministry of Finance of Japan stated that it is still too early to fully assess the economic consequences of this disaster. Some economists use the last major earthquake to hit Japan, the 1995 Kobe earthquake, in comparison. It killed 6000 people, with a financial burden of 13 trillion Yen on the public and private sectors (3).

The effect of disasters on the environment is estimated at close and distant spatial and temporal scope. Pollution or damage of the environment cross national borders and exert their effects on the continent(s). Physiographic features are the leading factors in the establishment of the quality of environmental components. Environmental pollution with lasting effect on the environment may affect the company's reputation, the outcomes of its operations; it can reduce the motivation and harm the health of the affected population.

As a result of the analysis establishes the following:

1. There is a reciprocal cause-effect relationship between disasters and business, resulting in harm to the environment and the functioning of society.
2. The interaction between the business units, business environment, society and the nature gives us a reason to treat them as components of comprehensive society-nature system. Due to the sudden nature of occurrence of disasters, whatever their cause, the system society - nature may be knocked off its equilibrium at any time, which is a prerequisite for the emergence of chaos in its functioning. This requires the activities of various levels of government in this system.

Measures at various levels of government

Effectiveness of disaster response, regardless of their nature, is based on the principles of management and management measures for the disastrous situation of the different levels of government.

Measures at a separate business unit

Disasters amend conditions of the environment in which business units operate. Managers must act quickly to allow as small as possible financial loss and public image

damage. Approaches used by businesses to deal with crises from natural and anthropogenic origin can be summarized as follows (4,5):

- anticipation and recognition of crisis
- preparation for crisis management
- recognition
- control
- overcoming
- reconstruction and practical
- retrieval of past experiences of crisis.

Most organizations in Western Europe and the U.S. have paid increasing attention to issues related to business continuity in case of disaster. Research shows that the most common essential errors are the following:

- there is no disaster recovery plan (Disaster Recovery Plan, DRP);
- only some of the company departments contribute in creating and updating the DRP;
- the DRP is not updated, so it takes into consideration the current risks;
- financing is provided on the "residual" principle and desire for savings.

Having knowledge of past typical mistakes and their removal and the prior training of personnel provides fast, efficient and cost-effective renewal and recovery of business after an emergency. In order to ensure continuity of business operations in planning for disaster recovery, organizations use three strategies: a preventive strategy, strategy of the expected scenarios and / or strategy to mitigate the negative effects (6). The events of September 11, 2001 in New York indicate that companies that were provided with emergency information systems, infrastructure, offices, etc. continued their activities with minimal interruption after the attacks.

The impact of disasters on businesses requires implementation of measures to reduce the negative consequences. Effective emergency management relies on thorough integration of emergency plans at all levels of government and non-government involvement.

Events at the level of society in individual countries:

The management of an emergency situation goes through four stages (7, 1).

The first is the immediate response to alleviate the most pressing human needs and management of the material damage (response).

The second step in crisis management is the restoration and rehabilitation (Recovery). Make a thorough analysis of the remaining risks and implements short-term and long-term activity to help the local population and economy. The recovery of private sector in the region is a prerequisite for the rapid recovery of the country

Once the effects of the current disaster have been addressed, the next phase (preparation phase) involves activities undertaken in advance of an emergency. Planning activities include developing hazard vulnerability assessments and other analyses, writing mutual aid operational plans, training response personnel, and improving public information and communications systems.

The fourth phase is to create long-term strategies to prevent new disasters (mitigation). Specific hazard mitigation plans are prepared following a current risk analysis and include a review of ways to eliminate or reduce the impact of future disasters.

Management of emergency situation takes place at several levels, depending on the distribution of effects of disaster. Establishing the properties of the components of the environment (OS) and change events in their place in the following spatial ranges (8): Locally (separate industrial site, industrial site, location, etc.).

Microregional level. The boundaries are separated by physiographic criteria (river basins) or administrative-territorial principle (municipalities, communes, districts). Business of a different character and needs of the population conducted in administrative-territorial boundaries, and therefore have paramount importance for the regulation of human impact.

State level. The role of government in dealing with disaster situations is justified on objective grounds, constitutional provisions and international treaties and conventions.

Investment in disaster management leads to fewer casualties and less damage. Appropriate example would be the contrasting effects of the earthquakes in Haiti (magnitude 7) and Chile (magnitude 8.8). In Chile, longtime investments in earthquake preparedness such as better construction, afforestation, etc. reduced fatalities by 1000-fold.

Activities at international level:

National governments bear the primary responsibility for dealing with disasters. In case of a disaster of enormous magnitude, however, when a given nation is overwhelmed, international aid is essential.

European Union offers such assistance through Civil Protection Mechanism, which coordinates the provision of specialized equipment and expertise to countries in need.

Disaster prevention pays dividends. Studies to date, while limited, show that for every euro invested in risk management roughly two to four euros are returned in terms of avoided or reduced disaster impacts on life, property, the economy and the environment (9).

Since 1980, the World Bank has approved more than 500 operations related to disaster management, amounting to more than US \$ 40 billion. These include post-disaster reconstruction projects, as well as projects with components aimed at preventing and mitigating disaster impacts, in countries such as Argentina, Bangladesh, Colombia, Haiti, India, Mexico, Turkey and Vietnam, to name a few (10).

There are four areas of activity relating to the integration of environment and development in policy, planning and management. The first group of actions is to improve the process of decision-making. This emphasis here is on measurements of individual factors of economic, social and environmental nature. The second set of actions is aimed at improving the planning and management. The third group of activities is related to data and information and their exchange between countries. And the fourth group is the requirement to periodically develop national strategies for resource management.

Our analysis reveals similarity between the measures taken to deal with emergency situations at each of the above mentioned levels, as they have a similar purpose - to stabilize at each level of the system society - nature and the system as a whole. Since changes at all levels of society-environment system are continuous, planning should take into account future risks.

Prediction of disaster situations and prospects for economy.

Some types of disasters can be predicted, for others this is not possible. Various scientific methods are used to monitor the development of trends, the knowledge of which could prepare the business for the upcoming prospects in the long term.

The process of globalization, accompanied by rapid technological changes raises issues of skills shortage in the workforce regarding the ongoing production process and behavior in emergency situations. Specific measures that improve the ability for effective disaster response are:

- cooperation between enterprises and organizations providing continuing professional education and training.
- continuing vocational training to improve the skill levels of the workforce. For this purpose, companies have to identify the training needs of its staff and to offer their own training or to finance courses run by outside organizations
- implementing programs and activities aimed at reducing the shortage of skills in the labor market and others.

Long-term trend caused by the economic development is the occurrence of climate change with different impact on different parts of the world. An example of the effects of climate change is the region of the Mediterranean. Scientific studies carried out to date indicate that the Mediterranean is expected to be hardest hit by the climate change. Geographical and climatic conditions under which agricultural activities take place in this region make Mediterranean agriculture particularly vulnerable to the adverse effects of climate change. These effects are expected to be:

- extinction of plants and loss of biodiversity;
- more desertification and an expansion of the arid areas;
- emergence of new diseases and disasters
- lower yields and large fluctuations in production;
- reduction of water resources.

In order to adapt to climate change, urgent and relevant measures must be taken to allow for better risk management in the agriculture sector, technical advice to farmers and provision of research and new technologies in service to the agricultural sector, etc. (11)

Other consequences of the economic development are air, soil and water pollution, which further destabilize the system

environment-society. The essence of environmental management is to limit the harmful effects and thus ensure acceptable quality of the environment. Destabilization of the environment locally has worldwide consequences of different proportions – hence the "Think globally, act locally". Several authors indicate that the environmental problems have led to improved macro-regional cooperation (8).

CONCLUSIONS

1. There is similarity between the measures taken to deal with emergency situations at different levels of management of the system society - nature.
2. Ensuring business continuity in times of distress can be achieved through a combination of technology and professionalism, taking into account the specifics of the company, its geographical positioning and its environment.
3. The emphasis in the management of emergency situations of natural and anthropogenic origin should be precautionary (preventive) measures.
4. Although the implementation of such measures is associated with additional investments, they are essential for the recovery of businesses in the event of a crisis, minimizing financial losses, and providing uninterrupted service to their customers. These are factors that determine the value of the company, its market position and image.

The analysis shows the complexity of interaction between economic development and disasters. By integrating social commitments and environmental concerns in business operations, companies can extend their commitment to society, which is the basis of the concept of social corporate responsibility.

REFERENCES

1. Georgieva K. The four phases of a disaster. <http://blogs.ec.europa.eu/georgieva/the-four-phases-of-a-disaster/>
2. Центърът за възстановяване след срыв - и детайлите имат значение, ЦЮ, бр.4/2008
http://cio.bg/1881_centarat_za_vazstanovyavane_sled_sriv_i_detajlite_imat_znachenie
3. Земетресение и цунами удариха Япония. http://www.capital.bg/politika_i_ikonomika/sviat/2011/03/11/1057619_zemetresenie_i_cunami_udariha_japoniia/
4. Аугустин Н., Управлявай кризата, Мениджър, 2009, 23
5. Люки Р., „Управление на кризи: Прогнози и преодоляване“, "Класика и стил", 2007г.
6. Санду Р., Оцеляване при бедствия и аварии, Дуо дизайн ООД, 2004, ISBN 954-8396-20-3, pp 28, 33
7. California Disaster Medical Response plan.
www.emsa.ca.gov/pubs/pdf/emsa218a.pdf, pp 14, 15
8. Управление на околната среда, юли 2010. <http://www.moderno.info/управление-на-околната-среда.html>
9. Planning for disaster. Options. A secure world. Summer 2006, pp 18, 19
10. World Bank Disaster Risk Management Projects <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTURBANDEVELOPMENT/EXTDISMGMT/0,,contentMDK:20196209~menuPK:341042~pagePK:148956~piPK:216618~theSitePK:341015,00.html>
11. Становище на Европейския икономически и социален комитет относно „Земеделието в Евромед“, Официален вестник на Евроейския съюз С 347, 18,12,2010, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:347:FULL:BG:PDF>