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Wind-related disasters management and prevention improvement strategy

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Abstract

The main purpose of the paper is to analyse the current situation and to provide suggestions for improving the Latvian system of wind disaster management by examining such sources as various scientific literature, different normative acts and specific practical examples. This paper briefly reviews the improvement possibilities to the Latvian system of wind disaster management by interaction between business, society and the state. The proposed hypothesis – timely, determined and coordinated interagency and interdepartmental cooperation – can minimize the effect and consequences of wind-related disasters. Several research methods, such as the analysis of academic and professional publications, and logical and comparative analysis, are applied in this research. The research results relate to the creation of disaster management policy methodology through increasing involvement of different stakeholders and development of deterrence measures. The main findings relate to the analysis of interaction of different public and private institutions for the management of wind induced disasters.

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Introduction

Corporate Social Responsibility intervention with respect to the reduction of wind-related disaster risk is still one of possible initiatives for sustainable development paradigm, although the concept and practice of corporate sector involvement in social development is not new in Europe. Private sector and corporate contribution to wind-related disaster risk reduction and disaster management strategies remains insignificant. Currently, corporate social

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responsibility is based on policies and activities that do not directly address the disaster management system. Most private persons and entrepreneurs implement the corporate social responsibility projects through their own initiatives mostly addressing the issues of health and education. Therefore, there is a case for NGOs and civil society in general to get actively involved in natural disaster management and thus influence and encourage the increased involvement of corporate social responsibility. Several research methods, such as the analysis of academic and professional publications, and logical and comparative analysis, are applied in this research.

1. Climate change problems in Latvia

Latvia also has encountered the climatic phenomena, unusual until now. In recent years, warm winters and strong gusts of wind often reaching the storm strength, are observed more and more frequently. Are such natural phenomena expected in the future? Studies carried out until now as Lawrence, Reisinger, Mullan, & Jackson (2013) and Rojas, Feyen, & Watkiss (2013) have shown that the average increase in air temperature is accompanied by changes in extreme air temperatures: increased number of days with high air temperatures and reduced number of days with low temperatures. In most areas, the number of frost days has decreased and in the Baltic Sea coastal areas the frost periods have become significantly shorter. The growing trend is demonstrated by extreme weather conditions associated with high temperatures during a many-year period. A significant increase is observed in the number of warm nights when the minimum air temperature is above +20°C and summer days hotter than +25°C. The increased heatwave duration is considered one of most dangerous phenomena. Positive growing trend is also demonstrated by indicators of extreme precipitation amounts, and this trend is most pronounced in cold time of year, especially in winter. Also in the city of Riga, the tendencies for changes are observed in both the air temperature and the extreme amounts of precipitation, which particularly relates to the increase in the number of summer days and tropical nights while the number of days with intense precipitation has also increased. It could be possibly associated with the increased intensity of urban heat island and specific urban climatic effect. (Latvian Environment, Geology and Meteorology Centre, 2015). As to the strong winds and storms, it should be mentioned that the Latvian observation station data did not show a clear trend for the increase in the wind speed. However, within the historical period since the 19th century, Latvian territory has been affected by more strong storms, which caused severe damages to forestry, power lines, agriculture and other objects. In coastal areas of the Gulf of Riga and the Baltic Sea, the increased storm frequency is predicted for the future as well. Future climate trends are anticipated basing on the forecasts of the global atmospheric circulation multimodal ensemble (see BACC Team, 2008, Meier et al., 2014). They concern mainly the prediction of average values of air temperature and atmospheric precipitation. Prediction of extreme events is very difficult, and scientists admit that it cannot be carried out accurately enough. Trends in climate changes anticipated for the future are similar to historical tendencies observed since the early 20th century. For Latvian territory, it means the average increase in the air temperature, which will become more rapid in winter and autumn seasons. However, the future increase in the frequency and intensity of storms could cause losses to the national economy, as well as adversely affect the marine coastal erosion processes and the flooding of wide coastal territories as a result of wind waves. In particular areas, global climate changes may cause not only negative but also positive effects. For example, in Latvian territory the increased air temperature during winter period means less energy consumption for heating of buildings. The increased length of the summer season and increased sea water temperature could affect the growth in tourism activities in coastal areas of the Baltic Sea and the Gulf of Riga during the summer season. Latvian territory's climatic conditions are largely influenced by global processes: the amount of solar energy and global atmospheric circulation processes; our future climatic conditions are largely dependent on global trends. Population, national economy facilities and other objects may be endangered by the storm with a wind speed of 25 m/s and more, which may cause breaks of electronic communication lines and electrical power lines, as well as damages to contacts and cables of urban electric transport and electric trains. Destruction or damage of dwelling houses and industrial buildings can take place, as well as vehicle accidents, devastation of forest, clogging of motor roads and streets (fallen trees, structures). Rainfall of 50 mm and more within 12 hours may cause rising water levels in rivers, flooding the lower places, house basements, etc. Strong snowfalls with snow cover growth 6-14 cm or more within 12 hours, snowstorm and icing may cause traffic disturbances, transport accidents, damages to power transmission and electronic communication lines, power supply

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