

THE OCCURRENCE OF STORMS IN THE AREA OF POLAND AND COUNTERACTING THEIR EFFECTS

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Abstract

Poland is threatened by occurrence of storms. Counteracting their effects is executed by the Polish government, especially the minister of Interior, minister of the environment and the minister of transport, construction and maritime economy. The law regulations enable preventing the negative consequences of the storms.

Introduction

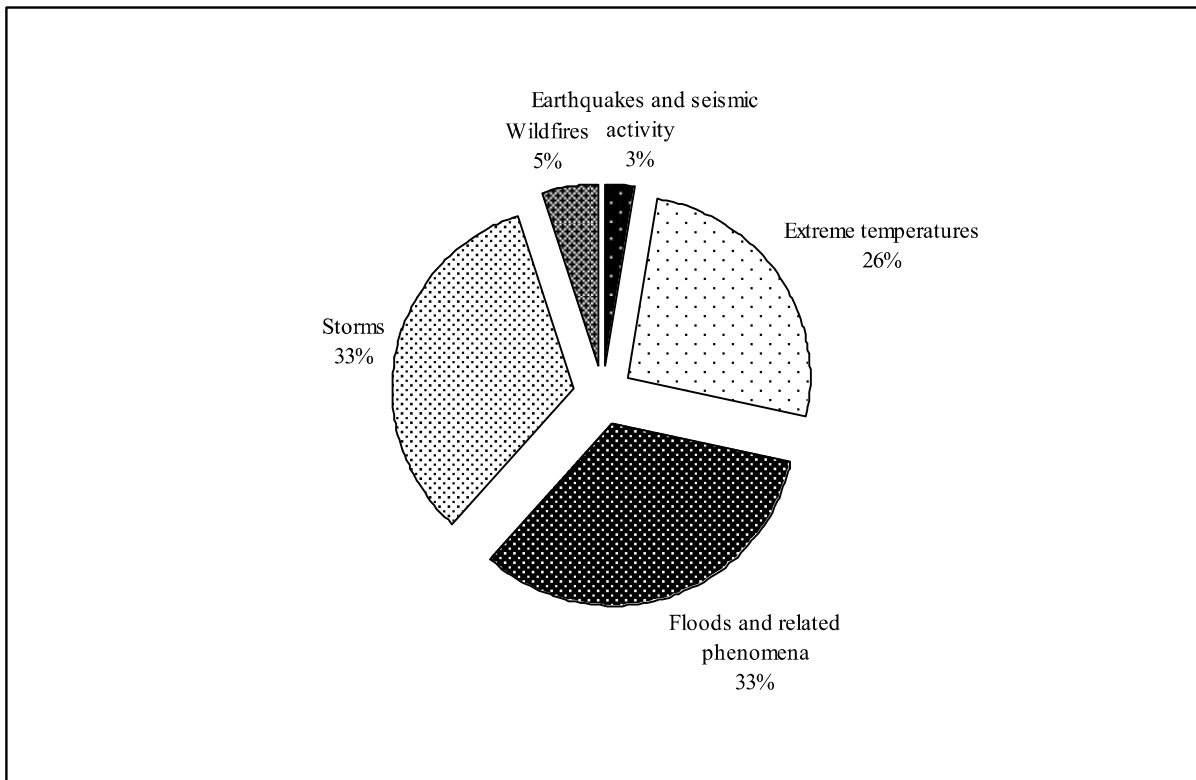
At the end of November 2011 a destructive storm occurred in Poland. The voivodships Podlaskie, Pomeranian, Warmian-Masurian, and West Pomeraniam were affected. The storm damaged the power lines, trees, cars and houses.

The storm can be defined as the wind with the speed of over 54 kilometres per hour which creates serious threats. We can distinguish three kinds of storms: the tropical cyclone (tropical cyclones – in the Indian Ocean and Australia; typhoons – in the western Pacific Ocean; hurricanes – in the North Atlantic Ocean, Caribbean Sea, Gulf of Mexico, eastern north Pacific and western coast of Mexico), the extratropical cyclone and the local storm such as tornado. The storms bring threats for human life and health, the environment and the economic activity [1, p. 154-184].

In relation to the negative consequences caused by the storms, preventing the effects of these kinds of events has a crucial significance for the economy of each country. The aim of this article is to present the occurrence of the storms and counteracting their effects. It is portrayed on the example of Poland.

1 Exposure of the storms in Poland on the background of other natural disasters

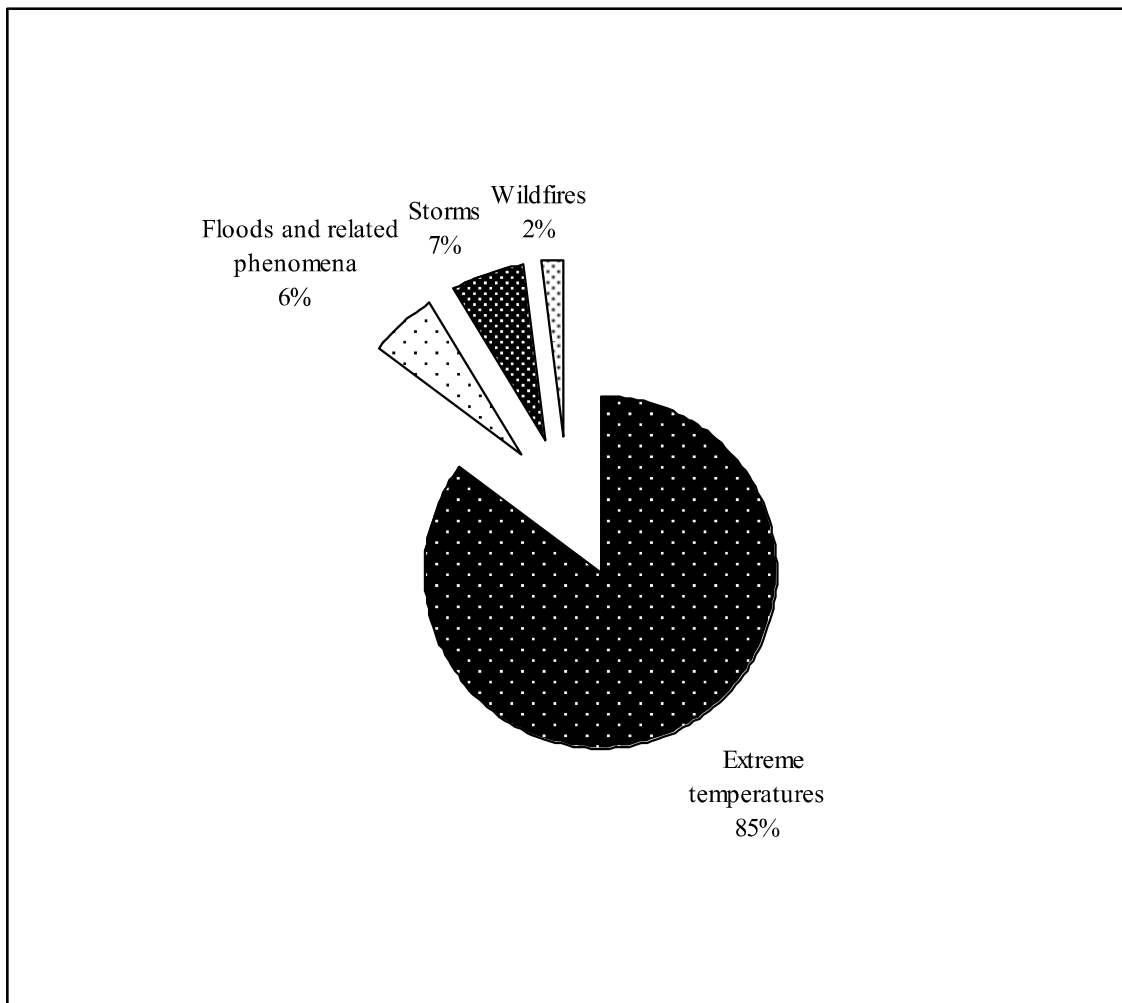
The Republic of Poland is situated at the Baltic Sea in Middle-Eastern Europe. Two mountain ranges called the Sudety and Karpaty lie in the southern part of the examined country. The main rivers of the state are the Vistula (Wisła) and the Oder (Odra). The climate of Poland is characterized as a transient of the mesothermal zone.



Source: [2]

Fig. 1: The percentage share of occurring storms in manifestation of the natural disasters in the area of Poland in the years 1919-2011

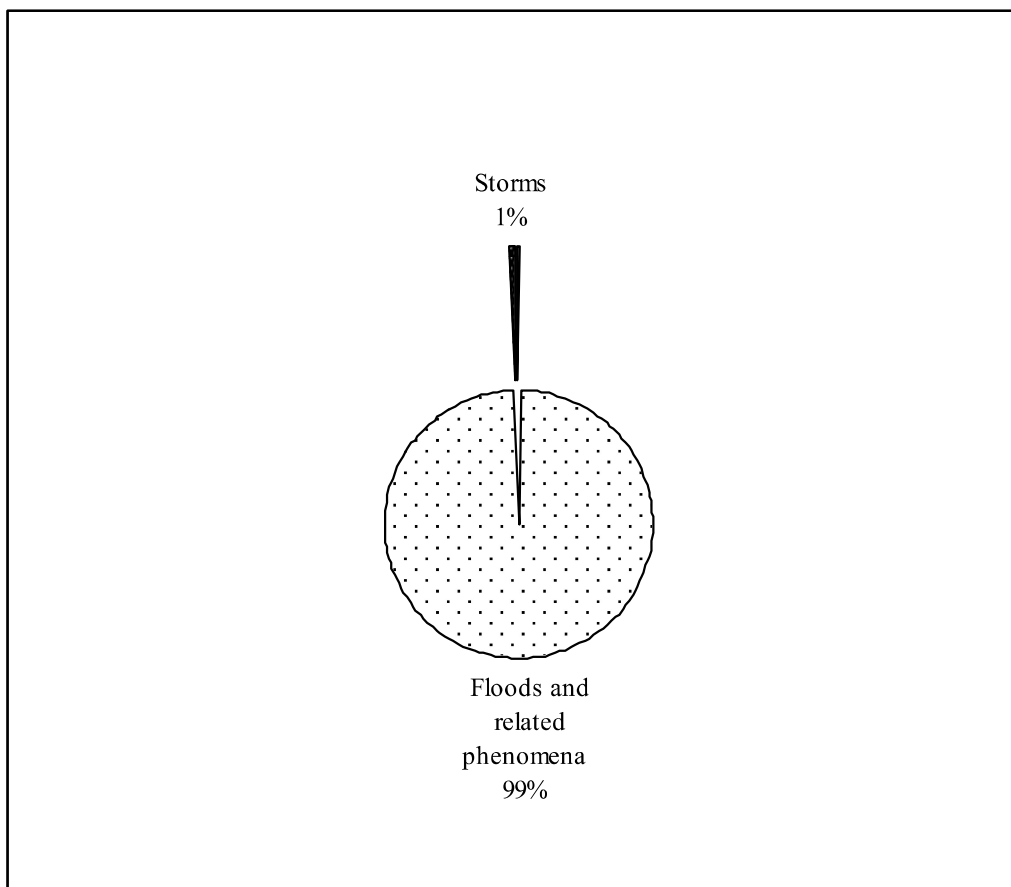
The percentage share of occurring storms in manifestation of the natural disasters in the area of Poland in the examined period is presented in the Figure 1. As we can see at the figure, the storms occurred as often as floods and the related phenomena. The storms and the floods are the hydrometeorological disasters. The most devastating storm orcan called ‘Kyrill’ hit in Poland in the year 2007.



Source: [2]

Fig. 2: The percentage share of storms in the deaths caused in the area of Poland in the years 1919-2011 according to the type of the natural disaster

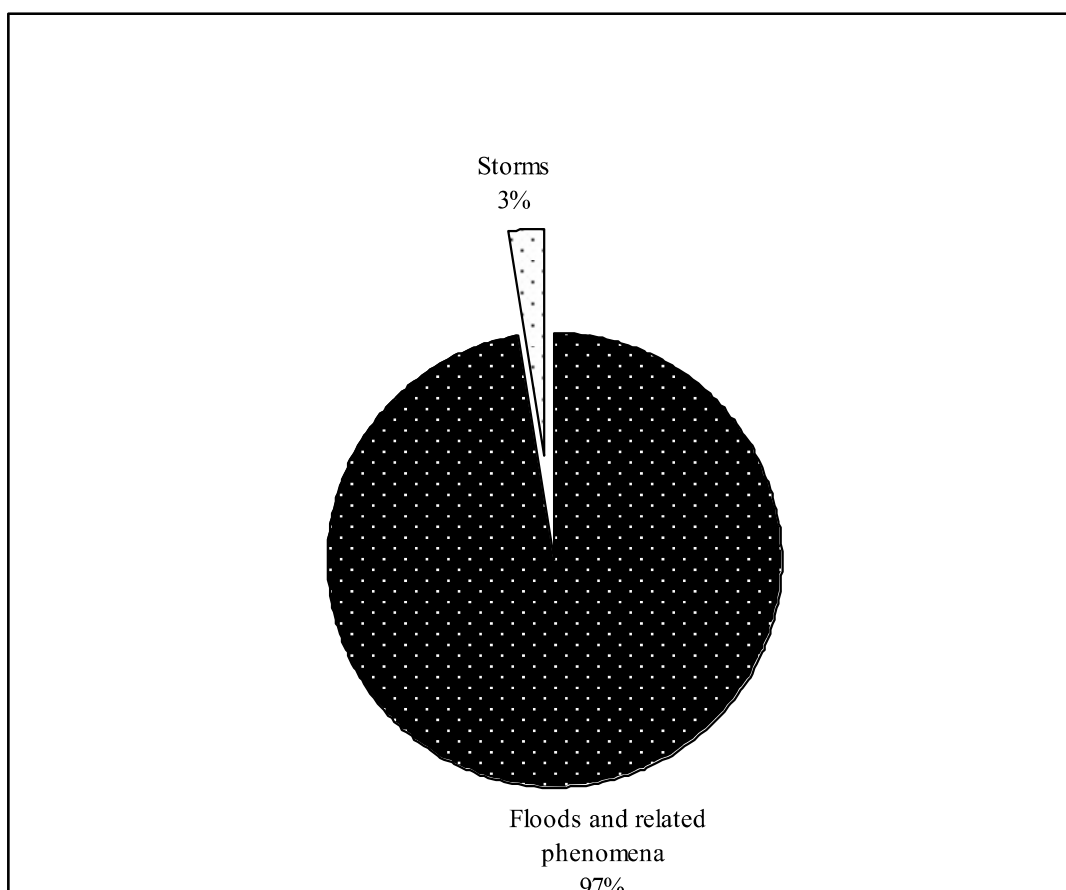
The percentage share of storms in the deaths caused in the examined country in the years 1919-2011 is presented in the Figure 2. As we can see, 7% of people were killed by the storms, which are the second type of the most deadly natural disasters in Poland after the extreme low temperatures. Due to the ‘white squall’, 13 people were killed in the Masuria region on the 21st August of 2007. The most deadly local storm killed over 80 people in Warsaw on the 6th July of 1928.



Source: [2]

Fig. 3: The percentage share of storms in the affecting of people in the area of Poland in the years 1919-2011 according to the type of the natural disaster

The percentage share of storms in the affecting of people in the examined state in the years 1919-2011 is presented in the Figure 3. As we can see, only 1% of people were affected by the storms. On the 1st of March 2008 over thousand people were affected by the extratropical cyclone called Emma. Affected people were homeless, injured and affected in another way.



Source: [2]

Fig. 4: The percentage share of storms in the damages caused in the area of Poland in the years 1919-2011 according to the type of the natural disaster

Tab. 1: The occurrence of the storms and their effects in the area of Poland in the years 1919-2011 according to the type of natural disaster

Type of the natural disaster	Number of the events	Deaths	Total affected	Damages in '000 US dollars (indexed to the year 2011)
Earthquakes and seismic activity	1	0	1,050	0
Extreme temperatures	10	1,576	0	0
Floods and related phenomena	13	113	368,574	7,933,000
Storms	13	124	2,042	213,150
Wildfires	2	35	0	0
Total	39	1,848	371,666	8,146,150

Source: [2]

The percentage share of storms in the damages caused in Poland in the examined period is presented in the Figure 4. The economic impact of the storm consists of the direct (e.g. the damages to the crops, housing, and infrastructure) and indirect (e.g. the losses of the market destabilization, revenues, and unemployment) consequences on the Polish economy. As we can see, only 3% of the damages are caused by the storms. The losses caused by the orcan

Kyrrill on the 18th January of 2007 exceeded US \$ 100 million indexed to the year 2011. The extratropical storm Emma on the 1st March of 2008 affected the damages estimated at US \$ 50 million. The floods and the related phenomena are responsible for the rest of the destructions.

The occurrence of the storms and their effects in the area of Poland in the years 1919-2011 are presented in Table 1. In the mentioned period, 13 registered storms killed 124 people, affected over 2 thousand people and caused over US \$ 200 million in damages. The total number of the natural disasters in the years 1919-2011 in the examined area exceeded over 39 events, killed nearly 2 thousand people, affected over 300 thousand people and caused over 8 billion dollars in damages.

2 Counteracting the negative consequences of the storms in Poland

In Poland, counteracting the effects of the storms is realized mainly on the basis of the Environment Protection Law. According to this Act, the Main Inspectorate for the Environmental Protection (IEP) is subordinated to the Ministry of the Environment. The Main Inspector for the Environmental Protection has 16 voivodship inspectors – one in each voivodship. The measures of the National Fund for Environmental Protection and Water Management (NFOŚiGW) and the Voivodship Funds for Environmental Protection and Water Management (WFOŚiGW) are assigned, among others, for: the tasks connected with increasing the area of the forests in the country and removing the losses in forests caused by the biotic and abiotic factors; counteracting the natural disasters and removing their environmental effects; executing the complex researching, developing and implementing programmes for the environmental protection and the water management and the ecological education programmes [11, art. 400a]. It is worth noting that the storms and especially the hurricanes or the tornadoes are not literally mentioned in the Environment Protection Law.

The other act connected with the presented laws, created on the basis of the European Union's Directives, is, first of all, the Spatial Planning and Development Act. It determines the principles of forming the spatial policy by the government administration and the local government units, alongside with the scope and the manners of proceeding in the matters of assigning the terrains for the specified purposes and formulating the principles of managing and development the terrains on the basis of the spatial order and the sustainable development. The requirements of this act concern e.g. the health protection and the public safety [12, art. 16, 39, 46], but there is no information concerning building the shelters in the event of the hurricane or the tornado. The territorial structure of the valid local development plans at the end of the year 2005 equalled to only 19.7%, and in preparation were the next 8,8% [8, p. 255].

The next act concerning the flood protection is the Law on Construction. According to the article number 80 of this act, the tasks of the architectonic-building administration and the building supervision on the national level, excluding the mining, are executed by the Main Inspector of the Building Supervision with subordinating inspectors, who are responsible to the Ministry of Transport, Construction and Maritime Economy [9, art. 80].

On the national, regional and local levels, the Constitution of the Republic of Poland has the primary meaning in counteracting the effects of storms. The Constitution is completed adequately on the lower levels of the administration by the acts: about the Voivod and the Government Administration in the Voivodship; about the Voivodship Self-Government; about the County Self-Government; and about the District Self-Government. According to the article number 228 of the Constitution, in the situations of the extreme danger, such as a storm, if the normal constitutional measures are insufficient, the adequate extraordinary state

can be introduced: the war state, the exceptional state or the natural disaster state [3, art. 28]. In the case of the last state, the principles of proceeding are precised in a different law – the Act on the State of Natural Disaster [10]. In practice, the Government of Poland avoids introducing the state of natural disaster because of the restrictions connected with it.

The Constitution and the previously mentioned laws are completed by the acts about e.g.: the Crisis Management; the National Emergency; the National Fire Guard; the Fire Protection; the Telecommunications; Preventing and Controlling of the Infections and the People’s Infectious Diseases; the Veterinarian Inspection; the Police; the Border Guard; the District Guards; the Common Obligation of the Republic of Poland Defense; the Sea Safety; the Physical Culture. Unfortunately, creating and developing the law is worse during the often repeated elections and the government reconstructions which cause the retardation in executing the programmes such as the Operational Programme for the Infrastructure and the Environment [4, p. 6-7], with one of the priority axis ‘Managing the capacity and counteracting the environmental threats’ [6, p. 123-128].

The expenses for the public safety, the fire and the health protection in the budget of the Republic of Poland in the period 2000-2010 in thousands of US dollars are presented in the table 2. In the year 2000 the measures were taken only in relation to the public safety. The total expenses exceeded US \$ 50 million indexed to the year 2011.

Tab. 2: Expenses for the public safety, the fire and the health protection in the budget of the Republic of Poland in the period 2000-2010 (in ‘000 of US dollars indexed to the year 2011)

Year	Public safety and fire protection*	Health protection	Total
2000	2,966	1,713	4,679
2001	2,971	1,762	4,733
2002	2,881	1,242	4,123
2003	3,078	1,320	4,398
2004	3,132	1,289	4,421
2005	3,275	1,246	4,521
2006	3,340	1,261	4,601
2007	3,812	1,764	5,575
2008	4,029	2,089	6,117
2009	4,187	2,096	6,283
2010	3,871	2,056	5,927
Total – all years	55,380		

Source: [2].

There is not a law in Poland that dictates insuring and reinsuring against the negative consequences of storms and other natural disasters. The assurance depends on the citizens who can use the services of the applicable companies; however, these firms are reluctant to insure against the effects of the storms on the threatened territories [5, p. 86].

Conclusion

The Republic of Poland is threatened by occurrence of storms and other phenomena. Counteracting their effects is executed by the Polish Government, especially by the Ministry of Interior, Ministry of the Environment and Ministry of Transport, Construction and Maritime Economy.

The Constitution of the Republic of Poland provides the law regulations which enable preventing the negative consequences of the storms. It is completed by the acts about: the Spatial Planning and Development, the Environmental Protection; the Construction; the State of Natural Disaster; the Crisis Management; the National Emergency; the National Fire Guard; the Fire Protection; the Telecommunications; Preventing and Controlling of the Infections and the People's Infectious Diseases; the Veterinarian Inspection; the Police; the Border Guard; the District Guards; the Common Obligation of the Republic of Poland Defence; the Sea Safety; the Physical Culture.

The mentioned law solutions are not sufficient. This situation is confirmed by the problems connected with e.g. the abandonments in the scope of the storm insurance and the reinsurance system, the lack of regulations in laws concerning building the shelters in the event of the hurricane or the tornado and the retardation in executing the programmes with the goals such as removing the negative consequences of the storms and rebuilding the capacity and the critical infrastructure.

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