

Tasks of Voluntary Rescue Teams in Extreme Weather Situations¹

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The occurrence of weather phenomena associated with extreme precipitation, temperatures and winds are not unusual in the history of meteorology in Hungary. However, in view of the characteristics of damages, it can be ascertained that they are usually witnessed at local (settlement) level; they damage the natural and built environment, jeopardise the safety of people and their financial resources. This greatly burdens the human resources of forces designated to respond to these anomalies, also their deployments, logistics and the management system of their equipment. The current Disaster Management Act created a resolution to this tension between damage prevention, response and rescue by declaring the possibilities of involving the voluntarism of citizens in organised and regulated frameworks. It means: in order to increase the country's safety, central, territorial, later district and settlement-level voluntary rescue organisations and teams may be established. These units, considering their capabilities, are able to effectively and efficiently manage the impacts of anomalies due to the weather.

In this publication, the author attempts to present Hungary's vulnerability due to weather extremities with the help of the disaster management classification of settlements, to analyse the deployment possibilities of voluntary rescue organisations and rescue teams, taking into account their capabilities established in the framework of the national classification system.

Keywords: *disaster management, volunteering, volunteer rescue organisation, extreme weather, storm, disaster management classification of settlements, National Classification*

Introduction

Weather-related damage events are integral parts of Hungary's meteorological events. In the world, the rise of weather phenomena can be clearly presented which for example, appears

¹ The work was created in commission of the National University of Public Service under the priority project PACSDOP-2.1.2-CCHOP-15-2016-00001 entitled "Public Service Development Establishing Good Governance" in the Egyed István Postdoctoral Program.

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in domestic firefighting interventions.³ The basis of this statement is the collection of data which is realised in data sheets uploaded to the Disaster Management Data Service Program.⁴ The types of uploaded technical rescue operations cover natural calamities, treefalls, outdoor fires, local floods which demonstrate the effects of extreme weather events on firefighting operations.

There are plenty of standardisation methods to identify weather phenomena and to determine their parameters, such as the hazard warning system of the Hungarian Meteorological Service,⁵ the national disaster risk assessment, the report on national disaster risk assessment methodology and its results. These documents reveal that the identification should be carried out related to temperature, rainfall and windstorm. For some domestic damage areas and damage sites related to extreme weather phenomena, it is typical that they influence the district level locally, increase the number of intervention forces, the wider defence-rescue capabilities, and the involvement of larger assets. The management becomes more complex (more administrative bodies, organisations, higher management levels are activated), the concerned infrastructures (vital-utility, residential) are damaged in every case. Damage-remediation activities may take from several days to several months, resulting in insurance claims, extremely high defence costs and material damage. There are possibilities for supporting intervention forces, such as rescue organisations and rescue groups which are based on the principle of volunteering.

This paper covers the disaster management aspects of domestic weather vulnerability, by its results the potential application of volunteer rescue organisations and rescue groups will be analysed.

Presentation of vulnerability caused by extreme weather phenomena by demonstrating the disaster management classification of settlements

According to point (1) of Section 21 of Chapter V of Government Decree 234/2011 (XI.10.), ‘Hungary’s settlements shall be classified in disaster management categories as a result of a risk assessment procedure conducted with respect to a given settlement’.⁶

Within the framework of a risk assessment procedure, according to Annex 2 of the Government Decree, hazard impacts should be considered in all cases. The disaster management classification procedure should be carried out for each settlement in the country.⁷

³ László Teknős, ‘The Psychological Effects of Extreme Weather Conditions – The Importance of Crisis Intervention in Disaster Management’, in *NISPAcee, Government vs. Governance in Central and Eastern Europe: From Pre-Weberianism to Neo-Weberianism?* ed. by Zsuzsanna Árva (Budapest: NISPAcee Press, 2014).

⁴ In Hungarian: Katasztrófavédelmi Adatszolgáltatási Program (KAP online). It includes the intervention statistics of the official disaster management organisation’s deployment units. With the help of this, data related to storm damage can be extracted arisen from the topic of the present paper.

⁵ In Hungarian: Országos Meteorológiai Szolgálat (OMSZ).

⁶ Decree No. 234 of 2011 (XI.10.) of the Government implementing Act No. CXXVIII of 2011 concerning disaster management and amending certain related acts, point 1, Section 21.

⁷ László Teknős ‘Kockázatelemzés a polgári védelmi területen’, in *Katasztrófavédelem 2014 – Tudományos konferencia*, ed. by József Dobor (Budapest: NKE, 2014), 101–102.

After assessing the real hazard impacts typical of the valid local features, the result of the risk assessment process will be the classification of settlements into three disaster management categories. The vulnerability levels/categories of settlements are contained in Annex 1 of the Decree of the Minister of the Interior (MoI) 61/2012 (XII.11.).⁸

Table 1: *Changes in the disaster management classification of settlements between 2012 and 2017*

Extreme weather				
	County	Class I	Class II	Class III
1.	Baranya	–	33	249
2.	Bács-Kiskun	–	4	113
3.	Békés	–	4	72
4.	Borsod-Abaúj-Zemplén	–	43	177
5.	Csongrád	–	7	48
6.	Fejér	–	3	96
7.	Győr-Moson-Sopron	–	27	138
8.	Hajdú-Bihar	1	35	43
9.	Heves	–	3	75
10.	Jász-Nagykun-Szolnok	–	25	33
11.	Komárom-Esztergom	–	17	39
12.	Nógrád	1	20	87
13.	Pest	–	7	81
14.	Somogy	2	61	73
15.	Szabolcs-Szatmár-Bereg	1	6	179
16.	Tolna	–	4	84
17.	Vás	1	21	94
18.	Veszprém	–	13	200
19.	Zala	–	–	257
20.	Budapest, capital city	–	13	1
Total		6 settlements	346 settlements	2,139 settlements
Grand Total		2,491 settlements		
Population affected		National: 6,047,872 persons Budapest: 1,088,619 persons		

Source: László Teknős, 2017, based on NDGDM⁹ data.

The 2016 data shown in Table 1 are the result of a risk assessment procedure. One of the elements of this process is the categorisation of the settlements themselves. The table shows that the number of settlements affected and threatened by extreme weather is 2,491, which is 74 per cent of all the settlements (3,177). The indicators of the weather extremities can be defined by the values found in the Hazard Warning System of the National Meteorological Service.

⁸ Decree No. 61 of 2012 (XII.11.) on the disaster protection classification of settlements and on the amendment of certain rules of disaster protection of Decree No. 62 of 2011 (XII.29.) of the Ministry of the Interior.

⁹ National Directorate General for Disaster Management, Ministry of the Interior. In Hungarian: Belügyminisztérium Országos Katasztrófavédelmi Főigazgatóság (BM OKF).

Table 2: Classification categories of settlements affected by hazard impacts of meteorological origin in Hungary in 2016

Hazard impact	Number of classified settlements total	Number of vulnerable population (persons)	Number of Class I settlements	Number of Class II settlements	Number of Class III settlements
			Persons affected	Persons affected	Persons affected
Extreme weather	2,491	6,043,798	6	346	2,139
			145,720	2,620,740	3,277,338
Extreme winter weather	1,034	4,287,496	14	236	784
			325,055	564,053	1,512,756
In 2016, there were 3,177 settlements in Hungary in total			179	1,325	1,673

Source: László Teknős, 2017, based on NDGDM data.

In Table 2, one can see the classification categories of settlements affected by hazard impacts of meteorological origin related to the number of the population. Extreme weather can be found in point a) of Annex 2 of Government Decree 234/2011 (XI.10.), under natural disasters and hazards of natural origin. It can be ascertained that out of the 3,177 settlements in Hungary, 2,491 settlements may be affected by hazard impacts of extreme weather origin. In the most vulnerable category (I), 6 settlements were classified; in Class II, 346 settlements and in Class III, 2,139 settlements, affecting altogether more than six million people. As far as winter weather vulnerability is concerned, one may ascertain that it is characterised by high risk despite the fact that due to the increase of mean temperatures in Hungary, the number of days with temperatures under freezing point is decreasing.

It can (also) be ascertained based on this that the weather phenomena incurring hazards should be addressed, and the disaster management-approach analysis should be continued.

Table 3: Changes in the number of natural disasters, storm-triggered incidents, fallen trees, water-triggered incidents between 2011 and 30 Sep 2017

Number of technical rescue deployments – on national level (based on closed TMMJ datasheets)					
	Incidents requiring response total	Natural disasters, storm-triggered incidents	Fallen trees (incidents)	Water-triggered incidents	TOTAL (incidents)
2011	27,344	2,188	5,910	3,033	11,131
2012	20,200	2,116	4,440	883	7,439
2013	23,985	2,143	4,241	2,086	8,470
2014	25,582	3,155	6,441	2,276	11,872
2015	24,846	3,674	5,292	951	9,917
2016	25,015	3,706	5,297	1,538	10,541
30 Sep 2017	25,414	5,726	7,409	1,661	14,796

Source: László Teknős, 2017, based on KAP online data.

Table 3 shows the total number of events related to technical rescue operations which required intervention from 2011. An increase can be noticed in case of natural calamities, storms and treefalls. It can be seen that natural calamities and storms rise compared to the data of 2011, an increase is showed illustrated in a linear trend. According to statistics, a higher number of intervention cases has to be calculated which predicts the fact that at a time of extreme intervention, the professional forces become more loaded. Based on KAP-online data, it is expedient to call up volunteers¹⁰ who are qualified in disaster management in order to apply them for managing this type of events.

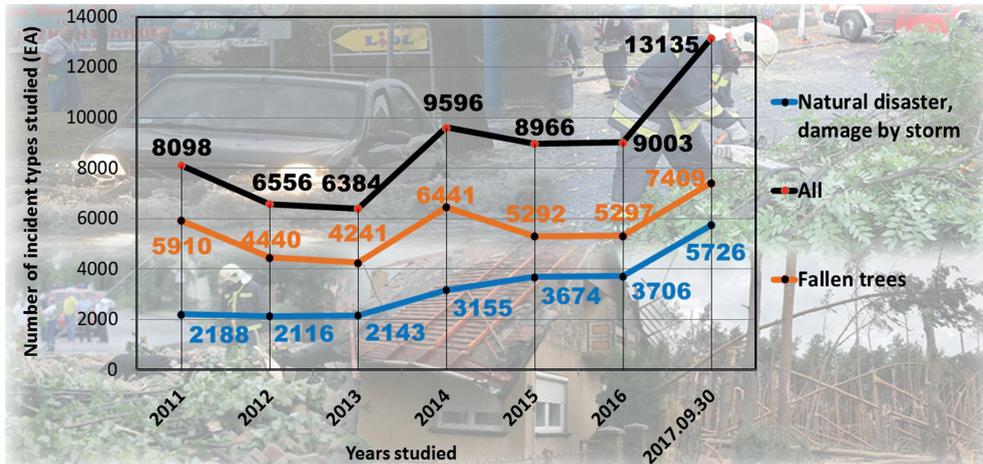


Figure 1: The occurrence of natural disasters, storm-triggered and fallen trees incidents within the technical rescue category between 2011 and 30 Sep 2017

Source: László Teknós, 2017, based on KAP online data.

Figure 1 is a complementary piece of information to Table 3. Within natural disasters, an increase may be observed with storm-triggered and fallen trees incidents. In case of storms, from 2013, it is even more significant. The content of the above figure also evidences that the trend in Hungary follows the increasing world-wide tendency of meteorological phenomena.

Regulation of the deployment of voluntary rescue teams – The national classification system

Under item (2) of Article G) of the Fundamental Law, one can read: ‘Hungary protects its citizens.’ To this end, it defines the rights and obligations. An obligation is, for instance, based on paragraph (1) of Article XXXI of the Fundamental Law, that: ‘Every Hungarian citizen shall protect/defend the fatherland.’¹¹ Its content affecting the protection against disasters can be found in paragraph (2) of Section 1 of Act CXXVIII of 2011 (hereinafter

¹⁰ Volunteer firefighting associations, rescue organisations, rescue groups.

¹¹ ‘The Fundamental Law of Hungary’, 25 April 2011.

referred to as Kat. tv.), according to which: ‘Every Hungarian citizen has the right and the obligation to participate in disaster management.’¹² A citizen may comply with the above through voluntary social activities, since, based on paragraph (2) of Article VIII of the Fundamental Law: ‘Everyone is entitled to establish organizations and join organizations.’ It is stressed by the stipulation in Act CLXXV of 2011, since the Hungarian National Assembly acknowledges that the voluntary collaboration of people is inevitable for the development of Hungary. Paragraph (1) of Section 18 of Act CXXXVIII of 2011 on disaster management and on the amendment of certain relevant acts states that persons providing voluntary assistance, the voluntarily participating social and charitable organisations may perform tasks related to disaster management.

The above-mentioned legislation, without being exhaustive, creates a voluntary institutional system of the protection against disasters.

Table 4: Division of voluntary rescue teams and organisations

				
Level	Central rescue team	Regional rescue team	District rescue team	Settlement-level rescue team
Examples	HUNOR Rescue Team	Budapest Voluntary Rescue Team ¹³	South Békés Rescue Team ¹⁴	Csepreg Voluntary Settlement-level Rescue Team ¹⁵
Number of organisations	6	20	178	1,099
Personnel (persons)	1,000	1,900	5,800	11,400

Source: László Teknős, 2017, based on NDGDM data.

In Table 4, one can see the division of voluntary rescue teams and organisations, demonstrating the different levels by some examples.

The total number reaches 20,200, which shows that voluntary rescue organisations and teams in Hungary constitute realistic potentials, increase the self-defence capabilities of settlements. It can also be stated that the level-by-level divisions are aligned with the levels of protection management, supporting the activities of organisations and entities established to implement the protection/defence functions of the state. The state supports the establishment of these forces by which it fulfils the state obligations set forth in the Fundamental Law. Some of the pictures in the table show that volunteers are wearing uniforms, they are disciplined, and they make an image of a strong, cohesive country representing a strong power. It can be stated that they are able to support the intervention

¹² Teknős László and Gotthilf Schweickhardt, ‘The role of the voluntary disaster management service in the education of the National University of Public Service’, *Bolyai Szemle*, no 2 (2015), 106–114.

¹³ ‘Megkapta a nemzeti minősítést a Budapest Önkéntes Mentőszervezet’, November 8, 2015.

¹⁴ ‘... a helyes cselekedet jutalma maga a tett...’, October 16, 2013.

¹⁵ ‘Önkéntes Települési Mentőcsoport alakult Csepregen’, May 25, 2016.

units of professional disaster management forces, their potential application should be kept in mind.

Professional disaster management bodies, in addition to the professional management of voluntary rescue organisations, are involved in the protection against the impacts of disasters and damage remediation. If the use of special skills and specialised equipment is required, the involvement of voluntary rescue organisations in response activities is ordered by the head of the territorial body of the professional disaster management body (director of the County Disaster Management Directorate).

Chapter VIII of Government Decree 234/2011 (XI.10.) issued on the implementation of Act CXXVIII of 2011 on disaster management and on the amendment of certain relevant acts stipulates the rules of participation of voluntary rescue organisations, in which it defines in detail:

- general principles
- requirements on the personnel
- technical requirements
- rules of registration and deletion
- rules of classification and its renewal
- special rules of participation in international relief

According to item (1) of Section 57 of Government Decree 234/2011 (XI.10.), a voluntary rescue organisation operating in Hungary may participate in the protection against the impacts of disasters and emergencies in Hungary once it has obtained a classification determined by the National Classification System, meeting the basic skills and preparedness requirements, conducted by the regional entity of the professional disaster management organisation.¹⁶ The classification procedure of voluntary rescue teams shall be conducted according to the National Classification System, based on the Act on Disaster Management and the provisions of Government Decree 234/2011 (XI.10.) issued on its implementation.

Procedures of the National Classification Exercises

The National Classification System is a classification, to be renewed every 5 years, elaborated by the central body of the professional disaster management organisation, based on the fulfilment of professional criteria.¹⁷ The National Classification System is a system established and adjusted to the Guidelines and Methodology, consisting partly of theoretical education, partly of practical training, defined by the United Nations International Search and Rescue Advisory Group, and provides classification.¹⁸

The newly formed voluntary rescue organisation conducts a system integration exercise, and the organisation wishing to obtain reclassification conducts a trial classification exercise before the classification exercise. A system integration exercise is a joint field exercise carried out for the first time, involving the units of a newly formed rescue organisation,

¹⁶ 'Nemzeti minősítési rendszer'.

¹⁷ NDGDM Instructions 6/2013 (X.31.) stipulates the requirements of the National Classification System.

¹⁸ Kristóf J Plébán, 'A települési önkéntes mentőcsoportok védekezésének feltételrendszere', *Hadtudomány* 26, no 1–2 (2016), 75–85.

where the units practice cooperation. A trial classification exercise is a command post and field exercise simulating a real situation, assisting in preparing the team for the National Classification Exercise, elaborated in accordance with the Organisational and Operational Guidelines issued for the rescue branch(es).

The National Civil Protection Inspector General organises the trial classification, system integration and national classification exercises in semi-annual cycles. A regional body (county directorate) prepares a conduct plan for the exercises, which will be submitted to the National Civil Protection Inspector General for approval 30 days prior to the exercise date by the head of the Department Emergency Management of the NDGDM.

The classification exercise should be prepared striving for conditions close to real life, to be performed in 36 hours continuously, without interruption. On the daily results of the classification exercise, the head of the Emergency Management Department of the NDGDM informs the Central Duty Office of the NDGDM by 18:00 hours in a digital way (electronic mail). The results are submitted by the Central Duty Office of the NDGDM in its Daily Report. The classified rescue organisations conduct annual exercises and regularly provide for the readiness level of the theoretical knowledge of their personnel and conduct refresher training courses.¹⁹

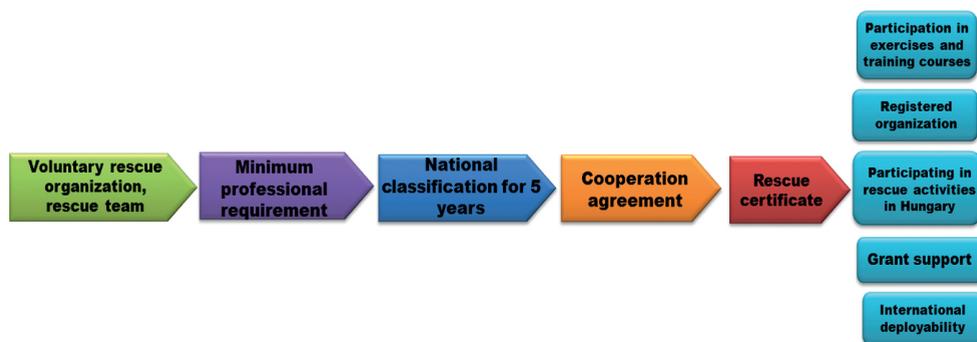


Figure 2: The sequence and elements of the Hungarian National Classification System

Source: László Teknős, 2017.

Voluntary regional civil protection organisations, after they are established, need to follow their Organisational and Operational Guidelines, considering both their structure and operation. For the first time, a voluntary organisation must submit an introductory background material, a so-called portfolio. With the help of this background material and the system integration field exercise, it must demonstrate its compliance with the Organisational and Operational Guidelines. The acquired skills and knowledge must be maintained by training, preparation and demonstration exercises held annually.

A rescue organisation, having acquired its certification, receives a rescue team certificate (rescue certificate/ID card), by which it is entitled to participate in rescue operations, to enter the confined incident site, and, at the same time, this certificate is also to prove that the organisation has appropriate equipment. A rescue organisation or team that qualifies for

¹⁹ NDGDM Instructions 6/2013 (X.31.) stipulates the requirements of the National Classification System.

this certification, signs an agreement, thereby accepting the coordination and management rights of the central body of the professional disaster management organisation (NDGDM), thereby it is registered. This registry is kept by the regional body (county directorate) of the professional disaster management organisation.²⁰

Criteria of acquiring the National Classification:

- introductory professional background material (portfolio)
- system integration exercise plan

Introductory professional background material (portfolio)

The necessary documents must be submitted in writing and in an electronic form to the National Civil Protection Inspector General by the head of the regional body. In the National Classification System, a voluntary rescue organisation that wishes to obtain national classification must comply with Sections 60 and 61 of Government Decree 234/2011 (XI.10.), related to the personnel and regulating the technical requirements, issued on the implementation of Act CXXVIII of 2011 on disaster management and on the amendment of certain relevant acts.²¹

Content and structure of the portfolio:

Chapters:

1. Brief presentation of the organisation (name, seat, function, date of establishment)
2. List of deployments (based on units)
3. Structure of the team (organisational chart and team composition, in a table)
4. Operation and presentation of units
5. Criteria for selecting team members
6. Mobilisation of the team, logistics and info-communication support
7. System of training, exercises, preparation
8. System of registry of equipment, its repair and maintenance
9. Method of health and medical care

Annexes:

1. Recommendation of the NDGDM regional organisation
2. Team operations procedure and functioning
3. Qualification documents
4. Team name list by assignment
5. List of equipment (cargoes and complete)
6. Certificates of life and accident insurance
7. Health care support (health records of the members, dog vaccination book)
8. Photos (with low resolution)

²⁰ 'Önkéntes mentőszervezetek'.

²¹ 'Nemzeti minősítési rendszer'.

System Integration Exercise Plan

The rescue organisation prepares and submits an exercise plan for the National Classification Exercise 30 days prior to the exercise via the head of the regional body for approval to the National Civil Protection Inspector General.

Based on the exercise plan approved by the National Civil Protection Inspector General, the rescue team or organisation gives evidence to the National Classification Committee, by carrying out a field exercise, in compliance with the Organisational and Operational Guidelines. It implements the exercise according to the Organisational and Operational Guidelines chosen by it. The document certifying the acquisition of the certificate is certified by the signature of the head of the rescue organisation, the director of the regional body and the head of the classification committee appointed by the Deputy Director General of the NDGDM. The voluntary rescue team or organisation, having acquired the National Classification, may renew its certificate every 5 years, by repeating the classification exercise.²²

Volunteers need to undergo a system integration exercise. This is a 36-hour field exercise to find out whether they have the skills meeting the basic professional requirements and whether they can meet the Organisational and Operational Guidelines. They have to continuously maintain their capabilities afterwards. Continuous training, preparation and demonstration exercises are suitable for this purpose. Another basic expectation of a voluntary rescue team is the appropriate level of readiness of the organisation, as rapid deployability is a key issue in their activity.

The classification exercise is mandatory to be repeated every five years. Participation in this classification procedure and a successful examination are necessary conditions in order that the rescue organisation may be involved and participate in rescue activities, furthermore, that the rescue team is included in the logistics system of the professional disaster management body. By way of participating in tenders and other non-cash benefits, its operation should be ensured. The operational strategy of voluntary rescue organisations, that is, the one related to the personnel, should be formulated as per Section 60 of the Government Decree, and as far as technical requirements, as per Section 61.²³

NDGDM Instruction 6/2013 (X.31.) on the criteria of the National Classification System contains the minimum professional requirements. Although the document is only a recommendation, the central disaster management body intends and requires that only organisations be involved in rescue operations and damage liquidation that meet the minimum professional requirements, based on which they had been classified. These requirements have been elaborated based on the Guidelines of UN INSARAG,²⁴ thus ensuring that Hungarian voluntary rescue organisations may join the international search and rescue system. The structure, the management, the rescue and the logistics component type of division of Hungarian rescue organisations, as well as the classification of urban

²² 'Önkéntes mentőszervezetek'.

²³ Ibid.

²⁴ INSARAG: International Search and Rescue Advisory Group, INSARAG. In Hungarian: Nemzetközi Kutatómentő Tanácsadó Csoport.

search and rescue activities by heavy, medium and light categories also contributes to international unity.²⁵

The compliance with these criteria ensures professional response capabilities. Given the capabilities of voluntary rescue organisations, they are deployable to natural or other disasters, such as canine search, ruin and area search, tracking, scuba-diver and water search and flood search and rescue. They can be used for technical, high- and low-angle rescue, aerial reconnaissance, medical rescue and first aid, complex rescue operations, etc. According to local, real vulnerabilities (see settlement classification), rescue organisations and teams are established. The National Classification System defines the Organisational and Operational Guidelines, taking into account the disaster management categorisation of settlements, for seven specialised branches. It could also be stated that these areas cover the Hungarian capabilities such as water and flood rescue, canine search, scuba-diving and rope rescue, command and control, basic water damage prevention, and urban search and rescue activities.

The main classification type of settlement-level voluntary rescue teams is focused on basic water damage prevention activities; however, the capabilities include flood and water rescue, storm damage mitigation, firefighting, technical rescue, damage liquidation, urban search and rescue, person research, rope (Alpine) technology, population protection activities, command and control, logistics.

As a summary, in case of incidents, in disasters and emergencies, only voluntary rescue organisations and teams are eligible for deployment that have acquired certificates within the framework of the National Classification System, or only such teams may be deployed to the incident sites. Rescue organisations participate, with the professional management of disaster management organisations, in protection activities and response activities against the impacts of disasters. The instruction right is exercised by a member being commissioned by a professional disaster management body. This person is in charge of the entire personnel of the rescue organisation, assigned by the Disaster Management Director with respect to the regional and settlement-level civil protection organisation, or with respect to the central civil protection organisation, by the Director General of the NDGDM. Rescue organisations perform their duties based on agreements with the professional disaster management bodies.

²⁵ Mónika Nováky, 'Önkéntes mentőszervezetek alkalmazásának lehetőségei', in *Modernkori veszélyek rendészeti aspektusai*, ed. by Gaál Gyula and Hautzinger Zoltán (Pécs: Magyar Hadtudományi Társaság Határőr Szakosztály Pécsi Szakcsoportja, 2015), 325–331.

Deployment possibilities of voluntary rescue organisations and teams

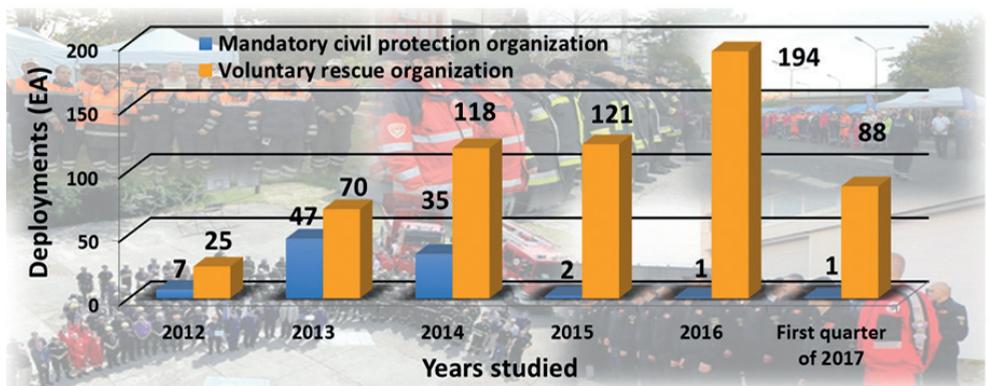


Figure 5: Deployments of mandatory civil protection organisations and voluntary rescue teams between 2012 and Q1 of 2017

Source: László Teknős, 2017, based on the data provided by the National Civil Protection Inspectorate General.

Volunteering is not just a European demand, but it is the best chance for a citizen to take part in the joint efforts against impacts endangering their lives, environment and valuables, according to their self-motivation.²⁶

Between 2012–2017, voluntary rescue organisations and teams were deployed in incidents, such as life-saving, rescuing injured persons, search and rescue of missing persons from water and underwater, extracting persons from wells, saving and extracting animals, firefighting, technical rescue, storm damage mitigation, removal of hazardous trees, foiling roofs, patient transport, lifting of sunken small boats to water surface, rescue of cars in snowdrifts, rescuing crashed motor gliders, flood and inland water protection, protecting residential areas, water removal, removal of accumulated rainwater, water pumping, ditch clearing, clearing of the lock system of fishing ponds, drinking water distribution, providing alternative heating and power supply, etc.

²⁶ 'Mentőcsoportok – Önkéntes mentőszervezetek az állampolgárok védelme érdekében'.

Examples of deployments of voluntary rescue organisations and teams

Storm on 08 July 2014

Table 5: Disaster management operations on 08 and 09 July 2014 on a national level

Incident time and type	Consequence			Deployment of voluntary rescue teams
Management of the incident originating from the storm of 08–09 July 2014 and the elimination of its consequences	<ul style="list-style-type: none"> affected counties: Békés, Csongrád, Hajdú damage to residential buildings and outbuildings trees fallen on residential buildings, broken electrical wires lightning struck in a sheep barn and Police Hq building multiplication of the number of disaster management forces (response personnel, operations control duty officers) 			Békés County: in the settlement of Végegyháza, the South Békés District Rescue team with 24 persons, 4 sets of equipment to eliminate storm damages.
				Gyula District Rescue team with 6 persons in Gyula to eliminate storm damages.
Total	Fire	Technical rescue	Incidents due to weather extremities	Breakdown in percentages compared to all incidents
478	82	346	274	57
224	15	171	115	51

Source: László Teknős, 2017, based on the Daily Report of the NDGDM Central Duty Office.

Sleet on 01 December 2014

Table 6: Disaster management operations between 01 and 04 December 2014 on a national level

Incident time and type	Consequence		Deployment of voluntary rescue teams
Management of incidents related to crushed grain formation and sleet, elimination of consequences 01–04 December 2014	<ul style="list-style-type: none"> affected counties: Borsod-Abaúj-Zemplén, Budapest, Heves, Komárom-Esztergom, Nógrád, Pest roadblocks disruption of power supply loss of mobile phone repeater station halt of a passenger train at a railway station multiplication of the number of disaster management forces (response personnel, operations control duty officers) operation of a local operations staff 		Pest County: The Pilis Rescue Team participated in the removal of fallen trees between Pilisszentkereszt and Dobogókő with 8 persons and 2 sets of equipment.
			Pest County: Gyál, Vác District Rescue Teams with 5 persons and 1 set of equipment each participated in the removal of fallen trees.
			Nógrád County: The Palóc Rescue Team participated with 5 persons, 3 sets of equipment rescuing persons trapped in the Drégely Castle Resort; and with 3 persons and 1 set of equipment rescuing a vehicle skidded in a ditch in Mihálygerge.
			Nógrád County: Mátra Rescue Team with 10 persons participated in the removal of fallen trees in the Mátra Mountains and other damage liquidation tasks.
			Nógrád County: The mandatory civil protection organisation of Mátraszentimre settlement with 20 persons participated in the removal of fallen trees in Galyatető and Mátraszentimre.
Disaster management operations	01 Dec	335 equipment, 1,317 persons, 608 operations	
	02 Dec	260 equipment, 962 persons, 400 operations	
	03 Dec	487 persons, 131 equipment, 256 operations	
	04 Dec	173 persons, 39 equipment, 122 operations	

Source: László Teknős, 2017, based on the Daily Report of the NDGDM Central Duty Office.

Extreme rainfall on 17 August 2015

Table 7: Disaster management operations between 17 and 20 August 2015 on a national level

Incident time and type		Consequence			Deployment of voluntary rescue teams	
Management of incidents originating in downpours and gales, elimination of their consequences on 17 and 18 August 2015		<ul style="list-style-type: none"> affected counties: Bács-Kiskun, Budapest, Nógrád Pest, Somogy, Szabolcs-Szatmár-Bereg, Veszprém roadblocks disruption of power supply damages to residential buildings, outbuildings, rainwater inundating residential buildings flash flood on a creek (Majs) rescuing 31 persons, accommodating 110 persons multiplication of the number of disaster management forces (response personnel, operations control duty officers) operation of a local operations staff 			Veszprém County: Tapolca settlement Civil Protection Organisation, with 6 persons, participated in sandbag protection in Tapolca.	
					Pest County: Szigetszentmiklós District Rescue team, with 4 persons in Szigethalom, water pumping activity.	
					Budapest: On 18 August, the Budapest Rescue Organisation with 40 persons, 28 sets of equipment in Budapest, water pumping activity.	
					Baranya County: Majs Creek flash flooded Majs settlement in Mohács District, threatening 11 residential buildings, water inundated a house, 20 voluntary persons placed 200 sandbags.	
Date	Total	Fire	Technical rescue	Incidents due to weather extremities	Breakdown in percentages compared to all incidents	Breakdown in percentages compared to technical rescue incidents
17 Aug	636	144	420	187 (storm)	29	44
18 Aug	427	52	326	238 (storm)	55	73

Source: László Teknős, 2017, based on the Daily Report of the NDGDM Central Duty Office.

Storm at Lake Balaton between 10 and 14 July 2017

Table 8: Disaster management operations between 10 and 14 July 2017 on a national level

Incident time and type	Consequence	Deployment of voluntary rescue teams
Management of incidents with large amounts of precipitation and hurricane, eliminating their consequences between 10 and 14 July 2017	<ul style="list-style-type: none"> affected county: Somogy several inaccessible road stretches, road blocks disruption of power supply large number of fallen and cracked trees, breaking of electrical wires, fallen pylons entire roofing of residential buildings removed by the gale multiplication of the number of disaster management forces (response personnel, operations control duty officers) operation of a local operations staff 	Somogy County: Sió Rescue Team, between 11 and 14 July, 8 persons, 1 set of equipment, logistics tasks

Incident time and type	Consequence		Deployment of voluntary rescue teams
Disaster management operations	10 July	66 firefighting deployments, in damage liquidation: 24 firefighters of 3 professional fire brigades, 2 persons from CRT, 17 voluntary firefighters and 3 onsite commanders	
	11 July	44 firefighters of 9 professional fire brigades, 60 voluntary firefighters, 4 onsite commanders	
	12 July	49 firefighters of 10 professional fire brigades, 23 voluntary firefighters, 3 onsite commanders. From 13 July, damage liquidation (besides new calls) was only necessary in Siófok	
	13 July	33 firefighters of 6 professional fire brigades, 14 voluntary firefighters, 3 onsite commanders	
	14 July	28 firefighters of 6 professional fire brigades, 17 voluntary firefighters, 2 onsite commanders	

Source: László Teknős, 2017, based on the Daily Report of the NDGDM Central Duty Office.

Storm in Orosháza, 06 August 2017

Table 9: Disaster management operations between 06 and 08 August 2017 on a national level

Incident time and type		Consequence			Deployment of voluntary rescue teams	
Management of the incident originating from the storm of 06–08 August 2017 and the elimination of its consequences		<ul style="list-style-type: none"> affected counties: Bács-Kiskun, Békés, Hajdú-Bihar several inaccessible road stretches, road blocks disruption of power supply at 4,645 consumers large number of fallen and cracked trees, breaking of electrical wires, fallen pylons entire roofing of residential buildings removed by the gale multiplication of the number of disaster management forces (response personnel, operations control duty officers) operation of a local operations staff 			Békés County: Orosháza and Mezőkovácsháza District Rescue Teams with 8 persons and 3 sets of equipment, liquidating the storm damages in Orosháza	
					Békés County: Körös Rescue Team with 2 persons and 1 set of equipment, carried out air reconnaissance in Orosháza settlement as damage liquidation task	
					Békés County District Rescue Team with 3 persons and 3 sets of equipment liquidating the Orosháza storm damages	
Date	Total	Fire	Technical rescue	Incidents due to weather extremities	Breakdown in percentages compared to all incidents	Breakdown in percentages compared to technical rescue incidents
06 Aug	636	144	420	187 (storm)	29	44
07 Aug	427	52	326	238 (storm)	55	73
08 Aug	215	46	113	60 (storm)	28	53

Source: László Teknős, 2017, based on the Daily Report of the NDGDM Central Duty Office.

In the early afternoon of 06 August 2017, in addition to the stormy wind gusts, a heavy thunderstorm arrived in our county sleet, which resulted in nearly two hundred emergency calls coming from Orosháza till 21:00 hours. The professional firefighters removed the fallen trees, broken logs and restored the damages caused by the storm to roof structures of real

estates. In the downtown of Orosháza, power supply was intermittent or disrupted. Major damages occurred to the roof structure of the Chronic Department of the local hospital. Firefighting units of disaster management were supported by the South Békés Rescue Team and the Körös Rescue Team, as well as by the voluntary Firefighting Association of Nagyszénás.²⁷

On 07 August 2017, the work of the local professional firefighters was supported by the Békéscsaba, Szarvas, Szentés and Hódmezővásárhely professional units, the Sarkad, the Tótkomlós, the Gyomaendrőd, the Füzesgyarmat and the Mezőberény voluntary firefighters associations and the members of the Sárrét Rescue Team and the drone unit of the Körös Rescue Team.²⁸

Table 10: Disaster management operations between 29 and 31 October 2017 on a national level

Incident time and type		Consequence			Deployment of voluntary rescue teams	
Management of incidents originating in downpours and gales, elimination of their consequences between 29 and 31 October 2017		<ul style="list-style-type: none"> rainwater inundating residential buildings flash flood on a creek (Majs) rescuing 31 persons, accommodating 110 persons affected counties: Bács-Kiskun, Baranya, Budapest, Csongrád, Fejér, Győr-Moson-Sopron, Komárom-Esztergom, Nógrád Pest, Somogy, Szabolcs-Szatmár-Bereg, Veszprém roadblocks, railway traffic outage due to fallen trees disruption of power supply at 71,742 consumers, delegation of some members into the Havaría Team of DÉMASZ at several fire brigades, IP telephony and internet service outage due to power supply disruption damages to residential buildings, outbuildings multiplication of the number of disaster management forces (response personnel, operations control duty officers) operation of a local and onsite operations staff 			Budapest: Budapest Rescue Organisation with 77 persons and 23 sets of equipment, liquidating wind storm damages	
					Komárom-Esztergom County: Környe, Oroszlány and Tatabánya settlement-level rescue teams with 16 persons and 6 sets of equipment, liquidating wind storm damages	
					Bács-Kiskun County: Petőfi Rescue Team, Baja District, Kecskemét District, Kiskunfélegyháza District and Harta settlement-level rescue teams with 10 persons and 5 sets of equipment, liquidating wind storm damages	
					Bács-Kiskun County: Kunszentmiklós and Kiskőrös District Rescue Teams in Kiskőrös, Kunszentmiklós, Lakitelek, Tass and Tiszaalpár settlements with 12 persons and 7 sets of equipment, liquidating wind storm damages	
Date	Total	Fire	Technical rescue	Incidents due to weather extremities	Breakdown in percentages compared to all incidents	Breakdown in percentages compared to technical rescue incidents
29 Oct	2,625	48	2,485	1,679 (gusts)	63	67
30 Oct	1,088	33	961	731 (gusts)	67	76
31 Oct	309	31	217	132 (gusts)	42	60

Source: László Teknős, 2017, based on the Daily Report of the NDGDM Central Duty Office.

Storms between 29 and 31 October 2017

²⁷ 'Jégesővel csapott le a vihar Orosházára', August 6, 2017.

²⁸ 'Még mindig dolgoznak az orosházi tűzoltók', August 7, 2017.

On 29 October 2017, a very strong cold front drifted over Central Europe and the Balkan Peninsula. The cold front rushed down through Hungary in just three hours, and the gusts over 100–110 km/h, throughout the country, caused falling trees breaking electric wires and train delays. The wind was measured the strongest at Lake Balaton, in Siófok, a gust of 131 km/h. The unusual time of the storm and the circumstances of its occurrence well fit into the extreme weather, often rich in storms, of 2017.²⁹

The meteorological phenomena listed above well illustrate the response operations, increasing in such times, mainly numerical peaks related to technical rescue operations. It can be seen that voluntary firefighters, voluntary rescue organisations and rescue teams contributed to the liquidation of mass incidents. Based on the data of the above tables and their related content, it can be stated that, for example, in case of weather incidents, it is necessary to use the voluntary units as an additional potential force. Considering both their numbers and their equipment, they are suitable for participating in interventions lasting several days, to ensure the safety of settlements, and to protect the local population from a disaster management aspect. Provably, they contribute to the effectiveness of local, district and regional protection.

In order to maintain this high level of professionalism, inter alia, it is necessary to develop, elaborate and upgrade the intervention modules, capabilities, capacities and the procurement of the necessary up-to-date equipment facilitating specialised activities.

Conclusion, recommendation

According to paragraph 21 of Chapter V of the Hungarian Government Decree no. 234/2011 (XI.10.), for example as a result of municipalities' disaster classification, the term *extreme weather hazard* was defined. According to Table 1, 2 and Annex 1 of the Government Decree, it can be stated that municipalities in Hungary are affected by extreme meteorological events, and most of the population is at risk. It can be identified that endangering weather phenomena need to be addressed, and the analysis from disaster management perspective should be continued.

Furthermore, Table 3 shows that among the types of investigated technical rescue operations – in terms of the total number of events requiring intervention – a rise can be observed in cases of natural calamities, storms and treefalls. Referring to weather-related vulnerability, it can be stated that the increase of potentiality of predetermined forces could be necessary, and the risks with rising tendency require a greater degree of responsiveness.

This is illustrated in Figure 4, which presents the so far established rescue organisations, rescue groups based on volunteering. In Table 4 it can be observed that domestic voluntary rescue organisations and rescue groups provide realistic potentialities and increase the self-defence capabilities of municipalities. It has also been carried out that the levels of defence management are aligned with their segments, supporting the activities of organisations established for accomplishing defence functions of the state. Some of the pictures in the table show that volunteers are wearing uniforms, are disciplined, and they make an image

²⁹ Ákos Horváth, 'A 2017. október 29-i vihar meteorológiai elemzése', October 31, 2017.

of a strong, cohesive country representing a strong power. It can be stated that they are able to support the intervention units of professional disaster management forces, their potential application should be kept in mind. Why? Because volunteers must meet the high standards of stringent intervention minimum requirements drawn up in NDGDM instruction no. 6/2013 (X.31.) about the basic requirements of the National Qualification System, in order to get involved in domestic or international incidents, accidents, emergencies and disasters. The National Qualification System declares professional competence and the possibility of the domestic voluntary rescue organisations for joining the international search and rescue system. Based on intervention activities of events related to weather phenomena presented in this paper, it can be said that the co-operation with partners and co-operative organisations, furthermore, the disciplined and professional task execution of the intervening staff played an important role during the elimination of damages. Damage elimination and eradication activities were effective and took place continuously despite the numerous cases of mass incidents. The co-operation and the vocation of volunteer firefighters and rescue units were key factors to success and efficiency.

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