Perspectives on the new challenges in disaster management – considering social vulnerability and building on resilience

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Introduction

Damages caused by natural disasters are rising all over the world. This tendency is expected to remain in the future: urbanisation is affecting areas located near rivers and seashores, while weather extremes are becoming more severe and more frequent, including storms and heavy precipitation. Hydrological and hydro-meteorological events are the most devastating disasters in Europe: the estimated sum of the economic losses experienced between 1900 and 2013 due floods are around 1,75 Tr USD, while around 20 million people lost their lives during these catastrophes. (Maskey & Trambauer, 2015)

The current disaster management paradigm often uses words leaving an impression that the authorities somehow shepherd the population towards the "expected behavioural forms". Using technological and law enforcement approach, the focus is put to the work of the authorities through the whole disaster management cycle. The overall aim of this is to minimize the physical risks in order to provide safety for the population and its material values. By contrast, an emerging approach takes social-economical aspects into consideration just as well as physical risk factors. The Social Vulnerability paradigm observes and address disasters with an interdisciplinary toolkit in order to reduce vulnerability and enhance the resilience of communities. (Fordham et al., 2013) This emerging paradigm already influenced policies in the Central-Eastern European region, which might be seen in the shift towards voluntary actors and civil society organisations engaged in response activities.

The fact that disasters afflict wealthy and poor people differently is above debates. The unequal distribution of disaster effects is observed both in countries with high economic outputs and in developing countries as well. Therefore it might be surprising that the discourse on particular disaster events mostly neglects social, political or cultural causes. (Oliver-Smith et al., 2016).

It has been demonstrated that disasters take more victims in lower income countries, while high income countries face larger economic losses with lower disaster related mortality. Although overall sum of economic loses are higher in wealthy countries, households in lower income areas have less or no savings, as well as limited access to insurances, therefore the relative financial burden is higher for them. (Sawada & Takasaki, 2017) Akter and Mallick (2013) developed a model describing the connection between poverty, vulnerability and resilience. In this model adaptive capacity, as one of the most important manifestation of resilience is in clear relation with income conditions: a low-income household have limited adaptive capacities as they have limited access to different services. Through their research, they showed that the relative value of losses suffered (value of the losses compared to pre-disaster income) is higher for the households living under poverty threshold than in the upper deciles. (Akter & Mallick, 2013) Another important factor is the availability of information: deprived and marginalized population have less access to both information and resources that are needed to anticipate and respond to a real or perceived threat. (Masterson et al., 2014)

The social vulnerability approach and its implementation

Poverty and the limits of human and physical resources are considered as the most important factors increasing the exposure of developing countries to disaster risks. (Balica et al., 2015) These conditions exist in the underdeveloped regions of high-income countries and in the segregates of prospering areas as well. This is especially true if we consider other means of deprivation: social marginalization can be seen in the forms of disadvantages in education, position in the employment market, dwelling conditions and accessibility of services. These all are circumstances define the opportunities of the individuals, households and communities for preparing for-, and recovering from disasters. (Tedim et al., 2014) In spite of all these, policies of Disaster Management often neglect social aspects. At the same time poverty and segregation processes and patterns led the most deprived groups to occupy areas with the highest risks. (Masterson et al., 2014) Many particular disaster events prove that the most devastating effects are developing in the isolated and marginalized communities, and the roots of these effects can be traced back to poverty and other means of deprivation, such as housing conditions and underdeveloped infrastructure. (Cole, 2004) Disaster prone communities are often stuck in a downward deprivation spiral and are unsuccessful to provide a fundamental level of human security to themselves. (James & Paton, 2015)

In the light of all these many academic and professional communities working on Disaster Risk Reduction realised that their common goal is beyond the humanitarian idea of immediate disaster relief. A new goal has been risen: to assist communities to be resilient and prepared by different means, including alleviation of poverty, good governance and higher well-being. (James & Paton, 2015) Debates on Social Vulnerably has been shifted accordingly from the simple definition of the concept towards the need of reliable metrics and indices. (Rufat et al., 2015) Indices should reflect reality, therefore composite vulnerability indicators should join social, economic, environmental, or engineering aspects. (Balica et al., 2015) As social vulnerability and its related quantification is very context-specific (Fatemi et al., 2017), a need for the establishment of a set of country specific indices can be phrased.

As good governance and collaboration with stakeholders serves an important part of this paradigm, community engagement is more and more researched by scholars and reflected in different policies. In a recent meta-analysis, Batory and Svensson (2019) showed that an important part of the literature investigating collaborative governance published in the recent years cover the topic of floods and risks. (Batory & Svensson, 2019)

Social vulnerability indicators for Hungary

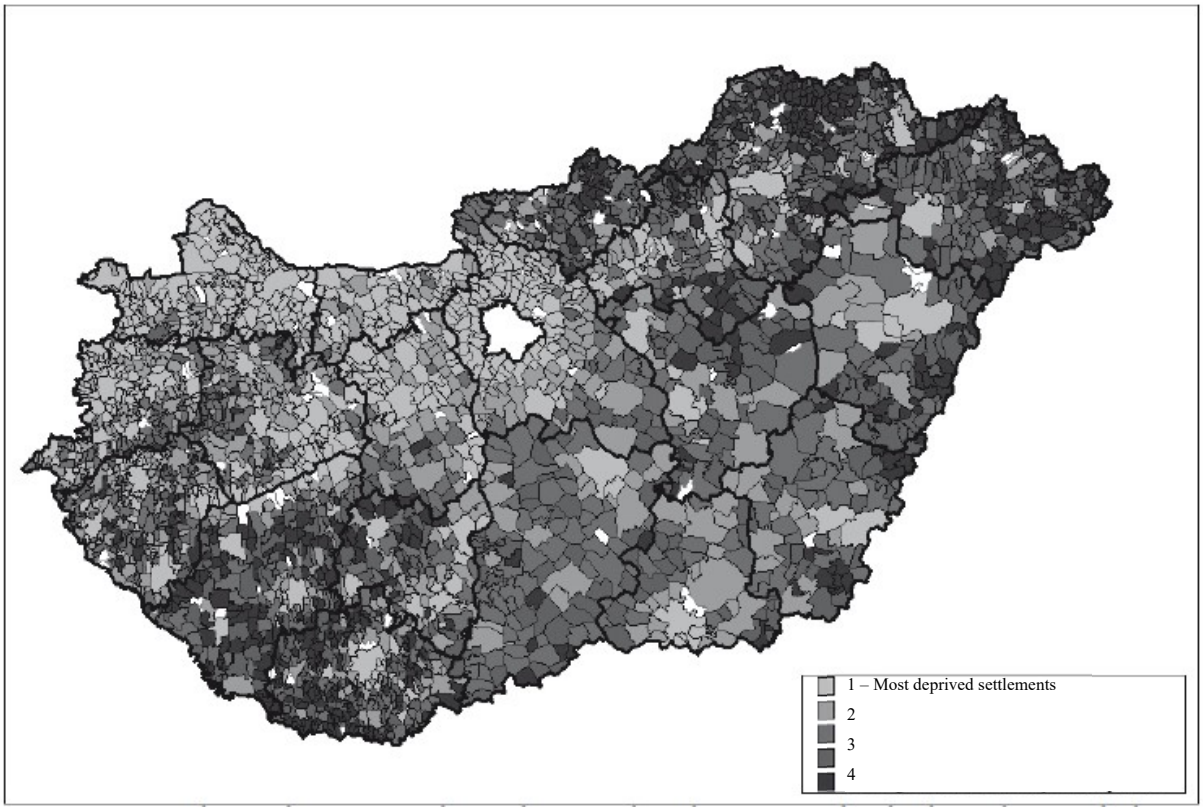
Although deprivation and poverty research have broad literature in Hungary, this section uses Koós's (2015) complex deprivation index for demonstration, as hazards and risks have strong spatial aspect. With this, the following paragraphs aim to shed light on the relevance of the social vulnerability paradigm in the Hungarian context and identifies an opportunity for its measurement.

The Koós Deprivation Index is based on different indices available in municipal level describing different means and layers of deprivation. This includes the following statistical indices describing the different social aspects of the settlements:

- Proportion of unemployed households;
- Unemployment rate (related to active population);
- Proportion of individuals with minimum secondary school graduation;
- Average annual per capita income;
- Proportion of dwellings without comfort-level.

Deprivation index is developed using Principal Component Analysis (PCA), therefore it is a relative index that shows the relation of the different settlements to the National average (excluding Budapest, the Capital City). (Koós, 2015)

It is worth comparing the Koós Deprivation Index with the meta-analysis of Rufat et al. (2015) researching the different indices of Social Vulnerability. The study examines 67 case studies with different indicators related to flood vulnerability. (Rufat et al., 2015) Based on its findings, we can state that the Koós Deprivation Index is a composite index in line with the mainstream of Social Vulnerability researches, that includes the second most used economic component and the housing component. (Molnár, 2017) It is also important to highlight, that the Koós Deprivation Index does not reflect on the most used demographic indices (for example average age, fertility, mortality), while components related to health status are also missing.



1. figure: Municipal deprivation in Hungary, 2011. (Source: Koós (2013)

The resolution of the index falls to the municipal level, which is also the level of the regulatory Municipal Risk Classification process. (Tóth et al., 2012) However, some components are missing from the Koós Deprivation index, this provides an opportunity to integrate social aspects into risk assessments and form a composite system of indices as Balica et al. (2015) suggested. One challenge with this is the fact that the Koós Deprivation Index is census based,

which happens in every ten years, therefore quick societal changes (eg. caused by financial crises) could be not reflected immediately with it.

Participatory engagement in Disaster Planning

Literature on the participatory engagement related to Disaster Management is somehow limited in the Hungarian context. As Hungary recently shifted towards more support and involvement of voluntary actors, many scholars investigated the role volunteers and volunteer rescue organisations in the past years (see eg. Endrődi, Csepregi, & Teknős, 2014; Hábermayer, Hornyacsek, & Muhoray, 2018; Nováky, 2015; Nováky & Endrődi, 2016; Plébán J., 2016). With the establishment of central, county, micro-regional and settlement level volunteer rescue groups, the topic is also popular among bachelor and master students.

Public awareness and education have been also researched by scholars, searching for new and effective ways to pass knowledge on risks and develop skills to cope with adverse effects. (see eg. Bányász, 2013; Bonnyai, 2013, 2014; Hornyacsek, 2008, 2011b, 2011a; Hornyacsek & Hülvely, 2009; Kovalovszki & Papp, 2018; Mógor, 2010; Veresné Hornyacsek, 2004). In this proceedings book, Túriné Barta and Hábermayer (2020) demonstrates the public communication activities of the Hungarian disaster management authorities, including social media, which opened new opportunities to interact with citizens.

Despite these two trending topics, volunteering and awareness raising, other societal aspects of disasters, risks and hazards, as well as participatory involvement of the affected population are rarely represented in Hungarian disaster researches. In a case study of a dyke development, Kispál and Nagy (2017) showed the importance of people's perception of hazards and risks in planning, and highlighted that more involvement of the local population would be beneficial during such developments. As presented later in this book, Sáfár (2018) extensively demonstrated the role of the Red Cross movement in resilience development for local communities. To implement theoretical frameworks, the Hungarian Red Cross put emphasis on the local communities in their resilience development programmes. (Molnár & Devaney, 2016)

A way forward

This editorial perspective aims to give a short insight on a trending approach in international disaster research literature, and to highlight the importance to involve different disciplines into the relevant discussions. Choices effecting risks and vulnerability are made by people, and

institutions dealing with disasters are socially, culturally and politically constructed. As Oliver-Smith (2013) phrased in an editorial piece, it is a matter of choice if we turn towards a real adaptation, which reflects more on human behaviour. In the time of new challenges like climate change, societal changes and ICT revolution, we must open to new approaches and other fields of interests.

Therefore, we made the Effective Response conference an interdisciplinary endeavour. We invited scholars and practitioners from all over the world, representing a wide range of disciplines and organisations. Without the need for completeness: civil servants, disaster management professionals, psychologists, IT and innovation experts, public policy researchers, engineers, social science scholars represented research institutions, public authorities and private entities.

This conference proceedings e-book includes papers from presenters of the event, reflecting the need for interdisciplinary and collaborative discussion. The following papers demonstrate practical challenges, theoretical questions and results from research projects and field activities. We trust that this initiative is a starting point to motivate further interdisciplinary research in the field of disasters. Hungarian Red Cross continues to motivate researchers of civil protection, public administration, psychology, sociology, anthropology, economics, natural sciences, engineering, and further fields, to be engaged in disaster related researches.

References

Akter, S., & Mallick, B. (2013). The poverty-vulnerability-resilience nexus: Evidence from Bangladesh. *Ecological Economics*, *96*, 114–124. https://doi.org/10.1016/j.ecolecon.2013.10.008

Balica, S. F., Dinh, Q., & Popescu, I. (2015). Vulnerability and Exposure in Developed and Developing Countries: Large-Scale Assessments. In P. Paron & G. Di Baldassare (Eds.), *Hydro-Meteorological Hazards, Risks, and Disasters* (pp. 125–162). Elsevier.

Bányász, P. (2013). A közösségi média szerepe a települések életében, kiemelten a rendkívüli események kezelésében. *Településföldrajzi Tanulmányok*, *2*(2), 137–145.

Batory, A., & Svensson, S. (2019). The fuzzy concept of collaborative governance: A systematic review of the state of the art. *Central European Journal of Public Policy*, *13*(2), 28–39. https://doi.org/10.2478/cejpp-2019-0008

Bonnyai, T. (2013). A lakosságfelkészítés lehetséges módszertana a létfontosságú rendszerek és létesítmények védelmének rendszerében. *Hadmérnök*, *VIII*(3), 58–73. http://hadmernok.hu/133_07_bonnyait.pdf

Bonnyai, T. (2014). *A kritikus infrastruktúra védelem elemzése a lakosságfelkészítés tükrében* [Nemzeti Közszolgálati Egyetem]. https://doi.org/10.17625/NKE.2015.001

Cole, S. (2004). Geohazards in Social Systems: An Insurance Matrix Approach. In Y. Okuyama & S. E. Chang (Eds.), *Modeling Spatial and Economic Impacts of Disasters* (pp. 103–118). Springer.

Endrődi, I., Csepregi, P., & Teknős, L. (2014). *Az önkéntes polgári védelmi erők új dimenziója , avagy a magyar Felsőoktatási Intézmények Önkéntes Mentőszervezeteinek megalakításának szükségessége , jelentősége a hazai katasztrófavédelmi rendszerben*. http://www.vedelem.hu/letoltes/anyagok/532-onkentes-mentoszervezetek-a-felsooktatasi-intezmenyekben-tudomanyos-dij-2014.pdf

Fatemi, F., Ardalan, A., Aguirre, B., Mansouri, N., & Mohammadfam, I. (2017). Social vulnerability indicators in disasters: Findings from a systematic review. *International Journal of Disaster Risk Reduction*, *22*, 219–227. https://doi.org/10.1016/j.ijdrr.2016.09.006

Fordham, M., Lovekamp, W. E., Thomas, D. S. K., & Phillips, B. D. (2013). Understanding social vulnerability. In D. S. K. Thomas, B. D. Phillips, W. E. Lovekamp, & A. Fothergill (Eds.), *Social vulnerability to disasters* (pp. 1–32). CRC Press.

Hábermayer, T., Hornyacsek, J., & Muhoray, Á. (2018). Katasztrófavédelmi önkéntesek motiváció kutatása a védekezések hatékonyságának növeléséhez. *Hadmérnök*, *XIII.*(2), 159–171. http://www.hadmernok.hu/182_12_habermayer.pdf

Hornyacsek, J. (2008). A lakosság önvédelmi készsége növelésének gyakorlata 1. *Polgári Védelmi Szemle*, *2*, 53–63. http://www.mpvsz.hu/letoltes/pvszemle/pv2008_2.pdf

Hornyacsek, J. (2011a). *A települési védelmi képességek a katasztrófa-kihívások tükrében* (1th ed.). "Biztonságunk érdekében" Oktatási- és Tanácsadó Tudományos Egyesület. http://www.drhornyacsek.hu/sajat publikaciok/vedelmi kepessegek.pdf

Hornyacsek, J. (2011b). Földrengés! fel vagyunk készülve? *Hadmérnök*, *VI.*(1), 276–295. http://portal.zmne.hu/download/bjkmk/kmdi/hadmernok/2011_1_hornyacsek.pdf

Hornyacsek, J., & Hülvely, L. (2009). A lakosság önvédelmi készsége növelésének gyakorlata 2. *Polgári Védelmi Szemle*, *1*, 124–140.

James, H., & Paton, D. (Eds.). (2015). *The Consequences of Disasters : Demographic, Planning, and Policy Implications*. Charles C Thmas Publisher LTD.

Kispál, J., & Nagy, G. (2017). A biztonság, mint szubjektív tényező a városfejlesztésben – esettanulmány Szolnok város példáján. In G. Keresztes (Ed.), *Tavaszi Szél 2017 / Spring Wind : Tanulmánykötet* (pp. 324–338). Doktoranduszok Országos Szövetsége. https://doi.org/10.23715/TSZ.2017.3

Koós, B. (2015). A szegénység és depriváció a magyar településállományban az ezredfordulót követően – avagy kísérlet a települési deprivációs index létrehozására. *Tér És Társadalom*, *29*(1). https://doi.org/10.17649/TET.29.1.2681

Kovalovszki, K., & Papp, B. (2018). Lakosságfelkészítés japánban a tokiói rinkai katasztrófamegelőzési park látogatása kapcsán. *Hadmérnök*, *XIII.*(2), 191–200.

Maskey, S., & Trambauer, P. (2015). Hydrological modeling for drought assesment. In P. Paron & G. Di Baldassare (Eds.), *Hydro-Meteorological Hazards, Risks, and Disasters* (pp. 263–282). Elsevier.

Masterson, J. H., Peacock, W. G., Van Zandt, S. S., Grover, H., Schwarz, L. F., & Cooper Jr., J. T. (2014). *Planning for Community Resilience : A Handbook for Reducing Vulnerability to Disaster*. Island Press. https://doi.org/10.5822/978-1-61091-586-1

Mógor, J. (2010). *A lakossági tájékoztatás és a nyilvánosság biztosításának kutatása a súlyos ipari balesetek elleni védekezésben*. Zrínyi Miklós Nemzetvédelmi Egyetem.

Molnár, A. (2017). A társadalmi sérülékenység vizsgálatának lehetőségei Magyarországon. In Z. Futó (Ed.), *Magyar vidék - Perspektívák, megoldások a XXI. században* (pp. 261–269). Szent István Egyetem.

Molnár, A., & Devaney, L. (2016). *Közösségi Reziliencia Városi Környezetben* (A. Molnár (Ed.)). Magyar Vöröskereszt. http://www.mek.oszk.hu/16400/16467/index.phtml

Nováky, M. (2015). Önkéntes mentőszervezetek alkalmazásának lehetőségei. *Pécsi Határőr Tudományos Közlemények*, *XVI.*, 325–331. https://doi.org/10.17047/HADTUD.2016.26.1-2.75

Nováky, M., & Endrődi, I. (2016). Polgári védelem és az önkéntesség. *Védelem Tudomány*, *I.*(4.), 271–283. https://vedelemtudomany.hu/?pageid=archive_articles&evfolyam=I&szam=4&ev=2016&ho=12

Oliver-Smith, A. (2013). A matter of choice. *International Journal of Disaster Risk Reduction*, *3*(1), 1–3. https://doi.org/10.1016/j.ijdrr.2012.12.001

Oliver-Smith, A., Alcántara-Ayala, I., Burton, I., & Lavell, A. (2016). The social construction of disaster risk: Seeking root causes. *International Journal of Disaster Risk Reduction*. https://doi.org/10.1016/j.ijdrr.2016.10.006

Plébán J., K. (2016). A települési önkéntes mentőcsoportok védekezésének feltételrendszere. *Hadtudomány*, *1*(2), 75–85.

Rufat, S., Tate, E., Burton, C. G., & Maroof, A. S. (2015). Social vulnerability to floods: Review of case studies and implications for measurement. *International Journal of Disaster Risk Reduction*, *14*, 470–486. https://doi.org/10.1016/j.ijdrr.2015.09.013

Sáfár, B. (2018). *A humanitárius segítségnyújtás elméleti és gyakorlati kérdései a Vöröskereszt nemzetközi tevékenységének tükrében*. National University of Public Service.

Sawada, Y., & Takasaki, Y. (2017). Natural Disaster, Poverty, and Development: An Introduction. *World Development*, *94*, 2–15. https://doi.org/10.1016/j.worlddev.2016.12.035

Tedim, F., Garcin, M., Vinchon, C., Carvalho, S., Desramaut, N., & Rohmer, J. (2014). Comprehensive Vulnerability Assessment of Forest Fires and Coastal Erosion: Evidences from Case-Study Analysis in Portugal. In J. Birkmann, S. Kienberger, & D. E. Alexander (Eds.), *Assessment of Vulnerability to Natural Hazards : A European Perspective* (pp. 149–178). Elsevier.

Tóth, F., Harmati, I., & Cseh-Szakál, T. (2012). Kockázatbecslési eljárás - Településeink veszélyeztetettsége. *Védelem Online*, *March*. http://www.vedelem.hu/letoltes/anyagok/430-kockazatbecslesi-eljaras-telepuleseink-veszelyessege.pdf

Túriné Barta, Á. (2020). Die Öffentlichkeitstätigkeit des ungarischen Katastrophenschutzes. In A. Molnár (Ed.), *First conference on Effective Response*. Hungarian Red Cross.

Veresné Hornyacsek, J. (2004). Katasztrófavédelem és közoktatás. *Új Pedagógiai Szemle*, *54.*(1.), 114–121. http://epa.oszk.hu/00000/00035/00078/2004-01-mu-Veresne-Katasztrofavedelem.html