Super Case Study

6

Education, cultural inclusion and disasters: lessons from Greece, the United Kingdom and Central Europe

Online Version

Super Case Study 6:

Education, cultural inclusion and disasters:

lessons from Greece, the United Kingdom and Central Europe

Lead Author:

Christian Morgner *University of Leicester, United Kingdom*

Contributing Authors:

Danuta Kaźmierczak *Pedagogical University Krakow, Poland*

Kalliopi Sapountzaki *Harokopion University of Athens, Greece*

Morgner, C., Kaźmierczak, D., Sapountzaki, K., 'Education, cultural inclusion and disasters: lessons from Greece, the United Kingdom and Central Europe', in: Casajus Valles, A., Marin Ferrer, M., Poljanšek, K., Clark, I. (eds.), Science for Disaster Risk Management 2020: acting today, protecting tomorrow, EUR 30183 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-18182-8, doi:10.2760/571085, JRC114026.

CONTENTS

1 Disaster education, culture and communication: a conceptual introduction

The effectiveness of education with regard to training depends on the extent to which education can ensure that cultural concerns are taken into account and reflected in the communicative strategies that disseminate information and knowledge of practices related to disasters.

This introductory part of the chapter will consider the roles of education and cultural inclusion as key resources in preventing, managing and mitigating disasters. Key definitions – of education, culture and communication – will provide a framework for three empirical case studies.

Education and training are traditionally divided into training for the professionals who deal with disasters (such as medical staff, firefighters and the military) and education for the general public. Professional training focuses primarily on the technical tasks and challenges related to particular types of hazards (Hagelsteen and Burke, 2016), which may include training on preventative measures, such as safe and well checks (formerly the home fire safety check, introduced in the United Kingdom in 1999) and consultancy on building regulations. Disaster education for the general public refers both to pedagogical strategies, including school-based initiatives and public-awareness campaigns, and to family and community learning (Preston, 2012; Shaw et al., 2011).

School-based initiatives offer training and training materials to teachers, who in turn raise awareness and preparedness as an ongoing part of their curricula (see Johnson et al., 2014). Such initiatives may also involve visits from professionals, such as firefighters or medical staff, who can assist with matters such as disaster drills. Community education programmes that cannot rely on such administrative structures and often work with volunteers who facilitate emergency response, direct self-assessment of the situation and assist the general public (Shah Alam Khan, 2008; Wisner, 2006).

It is vital to recognise that individuals (professionals and members of the public) are diversely embedded in societal structures through families, communities and professional organisations. This diverse embedding gives rise to distinct risk cultures, as people share various beliefs and values that influence their perception of disasters, their risk behaviours and their knowledge of disasters (Douglas and Wildavsky, 1982). Thus, risk cultures are interrelated with factors such as level of education, age, socioeconomic opportunities, religious beliefs and language skills. Risk cultures therefore relate not just to marginalised social groups, but to different other societal subgroups.

Older generations may have their own cultural background and understanding of the world, which can be different from those of youth cultures. Therefore, in this study we propose a more comprehensive understanding of culture, so that the complexity of risk perspectives and behaviours can be understood from the perspective of this chapter. We therefore propose to divide the risk cultures in relation to disasters into (1) organisational cultures, (2) communities and (3) national cultures.

BOX 1.

Typology of cultures

(1) ***Organisational cultures.*** Typical definitions of culture involve beliefs, values, language, history and attitudes, which are also applied to organisations that support disaster risk reduction, relief and reconstruction. These organisations formulate standards and norms that inform their understanding of safety, risk and disaster management. While such standardisation is a key feature of their operation, it also potentially creates a dangerous barrier to reflecting on how an organisation 'thinks' and 'acts' (see Ramalingam, 2013). This has important consequences on, for instance, how such organisational cultures recognise vulnerability, how they engage with their potential audience and how they deliver their messages and training.

(2) ***Communities.*** Local cultures are increasingly shaped by mobility and diverse lifestyles. It has become easier to move to and settle in other countries, which means that people with diverse cultural backgrounds (and, therefore, distinct understandings of disasters, risks and safety) move around the globe. This poses challenges for intercultural approaches to disaster management. As an instance of the diversity of communities, DiGuiseppi et al. (2002) report that the distribution of free smoke alarms in multiethnic neighbourhoods in London has not reduced injuries. In many cases, the alarms were not installed or maintained, as their value as a safety measure in an urban context was not understood.

Furthermore, societies are made up of subcultures that may include generational cultures, social classes, religious groups and many more, whose members have diverse worldviews. For instance, Harpur et al. (2014) report in a study on fire safety in relation to the elderly that members of the community identified the needs of the elderly for improved safety but felt that it was culturally unacceptable to intervene in another person's life. Similarly, Mitchell et al. (2008) report that the perception of children and young people as passive victims underestimates their potential in preventing and responding to disasters.

(3) ***National culture.*** Finally, cultural values and beliefs at a national or broader geocultural level, which are often supported by accounts in popular culture, affect internal views of disasters, which may relate to history and tradition. They define what is considered to be a disaster and thereby have an impact upon follow-up legislation. For instance, the events of 11 September 2001 had a strong effect on government legislation, policy and education in the United States (for an overview, see Tierney, 2007). Likewise, cultural values shape the view of external disasters and what counts as a disaster through the experience of other nations. For instance, the Fukushima nuclear disaster, in the context of Germany's image of Japan as one of the most technologically advanced nations, led to the shutting down of all nuclear power stations in Germany, as the technology was considered not to be safe. Nation states thus serve as a comparative framework, but this also shows that what counts as a disaster and what is meant by disaster vary according to broad cultural orientations (Birkmann, 2007).

Such cultural perceptions can therefore affect educational needs and training at different levels. For instance, organisational reactions to disasters depend on normative models of decision-making that rely on a chain of command, in which the situation is assessed and an emergency plan is formulated and executed. The more recent literature on organisational learning from disasters has emphasised the need for co-learning, participatory models and experiential learning, strategies that highlight a more interactive communicative approach. This research shows that disasters are situations of great uncertainty, in which decision-making is done in situ based on a more reflexive approach (Childs, 2005; Cohen-Hatlton et al., 2015), which requires communicative training that is more suitable to constant micro-negotiations that are used to clarify ambiguous information in such a situation (Weick, 2010). Restrictions on micro-exchanges to update decision plans have a cascading effect in which small problems grow bigger (Perrow, 1984).

Moreover, research on interactions between organisations and communities demonstrates that such interactions are a key factor in building trust, which has a substantial impact on the perceived capability of authorities and experts to deal with disasters (Wachinger et al., 2013).

At the school and community levels, there is an increasing awareness that simple and didactic top-down approaches, which simply deliver disaster education, must yield to more reflexive and collaborative learning strategies. This has opened new ways of engaging with communities through social media, citizen journalism and blogging, by which local citizens become enmeshed in interactions between 'old media' (TV and radio) and 'new media' (Twitter, WhatsApp). This network of communication is thus able to shape public accounts of the disaster and identify vulnerabilities (see Morgner, 2017).

Finally, at the national level, one cannot simply operate with an approach that assumes that more information, more campaigns and more communication will lead to better preparedness and knowledge. The cultural filters of societal subgroups (including age, gender and socioeconomic status) ensure that such messages are differently interpreted as regards their value and usefulness (Krüger et al., 2015; Otway and Wynne, 1989).

Recognising and understanding the interrelationships between education, culture and communication is crucial in an age of intensified and expanding hazards, increasing exposure and vulnerability, and international migration in a multicultural European context. Based on these conceptual considerations, this chapter will analyse three innovative case studies in Greece, Poland and the United Kingdom that demonstrate the importance of education and cultural inclusion in the prevention and management of disasters.

2 Case study I: multiculturalism and fire incidents

Cultural diversity and migration, and their relationship to fire hazards, as evidenced in the recent and deadly Grenfell Tower fire in London, need more attention and research within a European context of increasing internal and external migration.

Figure 1. *Grenfell Tower block, 4.00, 15 June 2017* ***Source****: Natalie_Oxford, 2017*

On 14 June 2017, a fire broke out in the 24-storey Grenfell Tower block of flats in London (Figure 1). This fire led to 72 deaths and more than 70 others were injured. The majority of the victims had an ethnic minority background, coming from a diverse range of countries, such as Afghanistan, Egypt, Eretria, Lebanon or Sudan (see BBC, 2018). Another example is the deadly Lakanal House fire in 2009, in Southwark, London, which also affected people from different ethnic minorities.

In 2017/18, 334 fire deaths and 7 300 non-fatal casualties were recorded in England (see Home Office, 2017). The estimated total cost of fire for England is on average around GBP 8.3 billion a year (see Department for Communities and Local Government: London, 2011). There is a growing body of evidence that suggests that ethnic minorities are more likely to be affected by fire hazards (see Duncanson et al., 2002; Asgarya et al., 2010). This seems particularly relevant within an EU context, where internal migration between European countries but also from outside EU is ingrained into European institutions. For instance, nearly 10 million people in the United Kingdom were foreign-born and about 40 % came from EU Member States.

To address such cultural factors within a context of fire hazards, a number of public information campaigns have tried to provide a solution. For instance, in 2005 and 2006, the UK Office of the Deputy Prime Minister ran a fire-safety awareness campaign that was promoted at the festivals of Diwali (Hindu), Eid (Muslim) and Chinese New Year. In 2008, as part of the Fire Kills campaign, it was discovered that the Survey of English Housing of 2004–2005 showed that Asian households had a 10 % lower level of smoke alarm ownership than the national average. This prompted an awareness campaign by the ethnic advertising agency Media Moguls, which, also as part of the Fire Kills campaign, produced ads for ethnic newspapers and television channels that were aimed at increasing the number of smoke alarms in selected communities (see Webb and Auckland, 2013).

Similar initiatives have had a more practical focus, trying to increase the number of smoke alarms by giving them out for free. More than 20 000 smoke alarms were installed in a number of multiethnic boroughs in early 2000 in conjunction with the distribution of free educational brochures. However, the research evaluating such initiatives demonstrates that they have little or no impact (see Camit, 2002; DiGuiseppi et al., 2002). No systematic research has been conducted to understand fire behaviour in these boroughs (for instance, why these people have a lower number of fire alarms), but it is assumed that culture plays a role (see Dean et al., 2016).

As a consequence, a research study was conducted in collaboration with the Leicestershire Fire and Rescue Service, supported by the Fire Research and Training Trust, to explore a novel direction. This research looked at all fire incidents ([1]). The initial research showed that more fire incidents as well as more severe fire incidents occurred among black and black British ethnic groups. A more detailed analysis of the composition of households, however, revealed that this finding was true only in households in which black and black British people came from the same ethnic group. Thus, there was a mitigating effect if members of the household came from different countries. This led to the conclusion that it is not culture per se that explains fire incidents but that a relatively homogeneous group in combination with distinct cultural living standards plays a decisive role.

Although education about fire incidents takes place in UK schools, it can safely be assumed that the general population most commonly acquires fire safety knowledge through general integration into British social life. Accounts in popular culture and recommendations by neighbours, friends and professional authorities enable access to relevant information and behaviours. Exclusion from such integration therefore poses the risk that relevant fire safety behaviours and standards will not reach all social groups.

Consequently, a survey and follow-up focus groups were conducted by the Lead Author to understand matters of access and communication in black and black British ethnic groups in Leicester and Leicestershire. The research revealed that a number of African nationalities, i.e. people from Somalia, Zimbabwe and other southern and east African nations (including Kenya and South Africa), strongly clustered in a few areas of the city. Unlike Leicester's South-East Asian population, which arrived over decades, the majority of these arrivals from Africa came within a short timeframe of a few years ([2]). For instance, about 10 000 Somali nationals arrived within a few years around the turn of the millennium, settling in Spinney Hills, Leicester.

Research on the communication patterns within and external to these communities revealed that they had created a social life that was based mainly on personal communication networks with people from the same ethnic groups. Members of the same ethnic groups were granted greater trust than non-members and consequently were the first points of contact in moments of crisis, from small car accidents to dwelling fires. This also meant that knowledge about fire safety depended largely on the knowledge of other members of the same community, creating a gap in terms of knowledge of fire-safety standards outside the community. Moreover, a precarious socioeconomic status meant that fire safety was not a top priority in terms of smoke alarms and other measures. Finally, the high trust in personal networks caused a kind of social sclerosis in the form of a lack of trust in institutional services.

In collaboration with members of the black and black British community, these issues were addressed as follows. Key gatekeepers from the community received basic training on fire safety. Their central role and trustworthiness ensured that the messages they spread would be legitimised and reach future immigrants, ensuring sustainability. Those gatekeepers would join a newly formed equality and diversity board that would serve as a mediator between the fire service and the community, ensuring co-learning on both sides. In collaboration with the Leicestershire Fire and Rescue Service, intercultural awareness training was developed and integrated into the training pathway for firefighters. Recommendations were made to change the data collection practice of the fire service to include demographic information for all types of incidents.

([1]) To overcome the limitation of missing ethnic classifications, it used a large number of fire incidents for which an address was recorded over a period of 4 years (2011–2015). This information was geocoded and correlated with geocoded demographic information (Office for National Statistics, 2011) such as proficiency in English, industry, occupation, multiple ethnic groups, religion, main language, ethnicity, economic activity, country of birth, highest level of qualification and age. The combination of fire incidents and demographic data led to a dataset of 369 562 entries.

([2]) As reported by the National Census 2011 (Office for National Statistics, 2011), 95 % of black Africans arrived after 1981

Because the study focused on the fire service and region of Leicestershire, it is limited in terms of the broader implications that need to be addressed in the future, including the need for public services to be more engaged with new arrivals to enable trust building from the beginning. It is recommended that strategic partnerships be created between fire services and other services, such as the National Health Service and police, but also with universities so that existing data can be better analysed and monitored. Such an early warning system would enable fire services to detect vulnerability at earlier stages. Urban fires do not have a direct link with climate change. However, climate change is considered a motivating factor in international migration.

3 Case study II: Floods in Central Europe as the trigger for building public risk awareness

Trans-national disasters, like floods, pose a particular challenge to cooperation of emergency services across nations due the different cultural and social orientations that direct risk assessment, preparation, response and recovery actions and those are determined by risk awareness.

This case study considers the role of different national cultures from the perspective of a cross-cultural disaster. The focus is on different flood management strategies during the great floods of 1997 and 2010 that affected Czechia, Germany and Poland. Floods in the Danube river basin are also mentioned as events contributing to the development of comprehensive, cross-regional solutions. This case study will demonstrate how these catastrophic events were triggers to improve risk management systems in the area of training and education from a cross-cultural perspective (Raadgever and Hegger, 2018).

The improvement of educational policy embraced, besides defence and engineering, cultural issues within vulnerable territories seen as elements of the regional and cross-border system. The process was streamlined by political, economic and social factors and can serve as an example of cultural inclusion understood as mixing the best problem-solving, creative, innovative and entrepreneurial practices (UNESCO, 2017)

The great flood of 1997 in Central Europe killed over 100 people, destroyed towns and villages, and contaminated the soil over large areas of Czechia, the Oder basin in Germany and Poland (Cowell, 1997; Kundzewicz et al., 1999). As a consequence, the International Commission on the Protection of the Oder against Pollution (ICPO) was established by the governments of the Republic of Poland, the Czech Republic and the Federal Republic of Germany and by the European Community on 26 April 1999 (International Commission for the Protection of the Odra River against Pollution, 2019).

The objective of these initiatives was to provide the best measures against flooding and pollution of the Oder, under the Water Framework Directive (Directive 2000/60/EC), which involved a new narrative of flood management based on expertise and information. The focus of ICPO was to build public awareness by providing updated maps with information about flood risk in the international Odra river basin, presenting information on selected physicochemical and biological parameters about international surface water from the international monitoring stations on the Oder, or creating ICPO-Kids, an educational webpage targeted at the youngest. Furthermore, the maps and databases were designed not only for governmental authorities, but also for e-learning platforms and mobile applications – tools for arising social awareness about flood and creating proper behaviours (Państwowe Gospodarstwo Wodne, Wody Polskie, 2019).

According to the State Fire Service in Poland, the flood of 2010 was one of the worst floods for 250 years, comparable in scale to the great flood of 1997. In 2010 the flood was responsible for 19 fatalities, affected more than 100 000 people and resulted in economic losses of around EUR 3 billion. In total, around 2 000 km^2 of land mass was flooded (about 0.8 % of the total Polish geographical area) (Matczak et al., 2016). This event was also a test of the new system and effectiveness of training within the framework of the BaltFloodCombat (BFC) Module established in 2009 to enhance national flood response capacity, strengthen European rapid response capacity and build multilateral civil protection capacity.

The BFC Module was a rescue module involving firefighters and logistic experts from Estonia, Latvia and Lithuania, co-financed and deployed by the EU Civil Protection Mechanism during the response operations in Poland. They had undergone several training courses, and the 2010 flood in Poland was their first task.

The evaluation results prepared by the Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO) were very positive (Walls et al., 2017). The BFC team demonstrated a high level of expertise and was adequately self-sufficient and flexible. After the completion of its mission in 2010, the international BFC staff continued training through the EU Civil Protection Mechanism, which would lead to the deployment of this group during heavy storms in Pomerania (Poland) in August 2017 and in Spain during torrential rains in September 2019 (Jones, 2019).

However, training did not only focus on professional organisations, but included educating the general public's sense of social responsibility and individual initiative, fostered by the transposition of EU legislation (Floods Directive (Directive 2007/60/EC) and Water Framework Directive), which gave new opportunities for non-governmental organisations (NGOs) to act (Morawski, 2014). NGOs possess the expertise and capacity to create relevant short-term and long-term programmes for the general public.

For example, the Polish Scouting and Guiding Association offers its own programmes including Central Bank of Innovation, Active Citizen of the World, Scouts School for Rescuers and Water Education. The level of training and education its members receive allowed them to effectively participate in operations during floods in 1997 and 2010 (Morawski, 2014). Thus, through a range of transnational initiatives, the flood management systems could build cross-border capacities for preparation and response. In addition to this, further initiatives were created to address recovery efforts across different nations.

The International Commission for the Protection of the Danube River (ICPDR), consisting of 14 cooperating states and the European Union, can serve here as a good example. The ICPDR goals are healthy and sustainable river systems, damage-free floods and implementation of the EU Floods Directive in the Danube River Basin ([3]).
However, implementation of the policy of sustainable systems can be hindered by various obstacles.

- Cultural differences (political and administrative approach/solutions). For example, generally accepted ecological solutions promoting green infrastructure are hindered by governance style in a given country, such as a lack of methodology, of a land registry or of access to the land (Spain, Italy, Romania, Slovakia).

- Natural obstacles. Part of the Vistula river is protected under the Natura 2000 programme, which blocks any other activity connected with flood management without prior and individual consultations.

- Lack of information about climate change as a main driver of flood risk, or lack of reference to climate

([3]) The frequency of flooding – 2002, 2006, 2010, 2013, 2014 – justifies the importance of those actions.

change in the flood management plans (Bulgaria, Romania and Slovenia). An example of good practice for climate change education is the ClimateChangePost website, which presents the latest news on climate change and adaptation (ClimateChangePost, 2020; this forum is based on the latest results in scientific journals, and reports by the Intergovernmental Panel on Climate Change and the European Environment Agency).

Risk awareness, which conditions the successful planning of all risk management stages, involves building cultural awareness (ensuring cultural participation, access, and the right to express and interpret culture), which drives all positive incentives and cooperation. And ethnicity is seen as a factor determining flood resilience (Fielding, 2017).

Diversity and inclusion are promoted by the Annual International Danube Days initiative (ICPDR, 2019). It is a cross-border and basin-wide event, which engages governmental, non-governmental and private sector organisations from 14 countries of the basin, which work together to organise river fairs and clean-up actions, conferences and awareness-raising activities, aquatic and sporting challenges, leisure cruises and fun youth events to promote a safer Danube. In spite of different cultures (ethnicities) and histories, people share a desire and responsibility to protect the region.

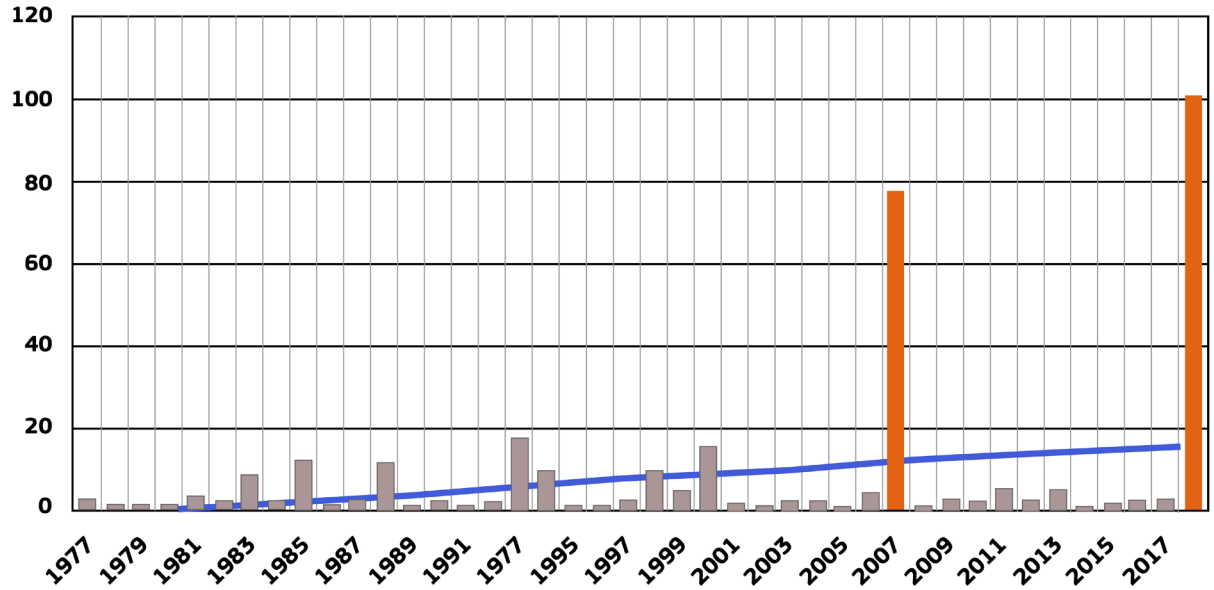
4 Case study III: experiments of cooperation between universities, authorities and school communities for risk education, Greece

Forest fire risk management involves the community exposed and several organisations, each of which has partial knowledge and a distinct risk perception and culture usually focusing on a specific disaster risk management (DRM) phase (prevention or emergency). Bridging the divides and consolidating a culture of prevention is a precondition for success.

Historically, Greece has been exposed to multiple natural and climate-related hazards, predominantly floods, earthquakes, heatwaves and forest fires. Recently, forest fires have become a top-priority hazard and challenge for the country and especially for the responsible institutions and communities in mixed forest and residential areas. The increase in exposure and forest fire disaster risk is probably associated with climate change and the expansion of wildland–urban interface areas since the 1970s, and it is evidenced in the human losses caused by disaster events almost every year since 1977 (Figure 2).

The situation is expected to worsen further in the future as a result of climate change. According to the committee established by the central bank of Greece to report on climate change impacts in Greece (Bank of Greece, 2011), the extremely high risk of wildfire (depending on the humidity of the air, 24-hour total precipitation, air temperature in the middle of the afternoon and the maximum speed of the average wind) will increase by 20 days in the period 2021–2050 and 40 days in 2071–2100 for eastern Greece and slightly less for western Greece. In 2007 and 2018 the country experienced deadly forest fires (84 deaths and financial losses amounting to EUR 3.5 billion in 2007; 102 deaths in Attica alone, the capital region, in 2018) and the public debate on the reasons for the dramatically failed disaster management endeavours is still going on.

Figure 2. *Annual distribution of human deaths due to forest fires in Greece, 1977–2017.*
Source: *GFMC and the Independent Committee of Experts for the investigation of Forest Fire Causes, 2019.*



The national culture concerning forest fires and their management is predominated by an over-emphasis on hazard factors and not on exposure and vulnerability. Consequently, forest fire DRM is considered mostly a matter of the forest fire suppression mechanism and not an issue of prevention, preparedness and sustainability at the community level. This misconception (aligning with tolerance of illegal building development in forest areas) generates difficulties in understanding and cooperation even mutual acceptance in DRM of the institutions responsible for emergency operations on one hand (e.g. Fire Brigade) and those that are involved in prevention and preparedness (e.g. Forest Service, Spatial Planning, Education and Awareness) on the other.

This split of perceptions and knowledge between the organizations involved explains failures in DRM to a great extent (Kalogirou et al, 2011). In particular, Fire Brigade claims the exclusive responsibility of Forest Fire Management setting aside the necessary preventive policies by means of spatial planning and education - awareness institutions. This results in spatial and land use policies undermining whatever efforts for forest protection and forest fire risk reduction, in community unawareness of exposure and vulnerability in wildland urban interface areas and a culture of irresponsibility of citizens regarding forest fire risk mitigation (Sapountzaki et al., 2011).

Changing the culture of organizations and communities toward forest fire prevention assumes, among others, long-term forest fire risk education and training to start at the school level. In 2010, in the context of the EU project Linking civil protection and planning by agreement on objectives (INCA), a team of researchers from Harokopio University of Athens and the Institute of Mediterranean Forest Ecosystems, in collaboration with the regional authorities of Attica, planned and implemented measures to bridge forest fire risk knowledge, cultural and perception gaps between the institutions involved and the general public. Among the measures implemented, there were two successive seminars on forest fire causes, prevention and self-protection for 43 pupils (12–14 years old) of a public school in the municipality of Kalyvia in Attica.

While this seems a purely civil protection measure, it contributes nonetheless to forest fire prevention through the emphasis of the seminars on the land use conflicts behind the causes of the phenomenon (Greiving et al., 2012). Kalyvia was selected as a pilot case because it had had a high record of forest fire disasters owing to its extensive mixed forest and residential areas. The material of the seminars was organised to include information concerning the forest fire phenomenon, causes and impacts, the areas exposed and prevention possibilities; they also gave guidelines for actions to do and not to do for personal safety, in line with the standards/norms set by forest fire management authorities.

PowerPoint presentations and videos were considered the most suitable visual aids to be used for pupils of this age, and these were prepared by the team of scientists and practitioners. Each seminar was preceded and followed by an appropriate questionnaire, which the pupils completed twice (before and after). The questionnaire aimed to (1) address pre- and post-seminar forest fire knowledge and risk perceptions of pupils and teachers, (2) assess the actual effect of the seminars on the school community's initial perceptions and awareness levels, and (3) get feedback for adjustment of the seminars and the overall forest fire risk communication strategy for young people and their community towards a culture of prevention. Statistical processing of the answers has produced the following important findings (Spountzaki and Varympopioutou, 2011).

- The impact of the two seminars has been significant on forest fire risk knowledge but not so significant on sensitivity and perceptions.
- The meaning of prevention remains rather vague in pupils' minds; for example, they consider fire hydrants or firefighting aeroplanes preventative means.
- Pupils' perceptions of forest fire causes are characterised by contradictions. While the majority acknowledge that houses in forests increase the risk of forest fire, most of this group prefer to continue living in the forest rather than in a settlement.
- The majority judged the seminars useful and worth including in routine school curricula. However, they should only be included after scientists and practitioners had aligned their diverse views.
- Pupils have their own imaginative proposals for promptly alerting fire stations. Some proposed audible fire alarm systems to be placed in the forests, while others proposed vigilant forest monitoring

The overall success of the programme was due to the effective cooperation of different organisations involved in forest fire risk prevention and awareness: university and research institutions, a municipality, regional authorities and a school community. The programme succeeded in bridging complementary knowledges and diverse cultures (organisational and societal, including different generations and social classes). The process demonstrated that a knowledge-intensive institution is a necessity; it enjoys (a certain degree of) credibility and trust, it is acceptable as a negotiator and external to the conflicts between local and regional authorities and different sections of administrations (see also Lofstedt, 2005).

In 2018 (November) and after deadly flood and forest fire disasters in Attica, certain schools requested the support of universities to organise seminars for pupils about seismic, forest fire and flood disasters. The Department of Geography of Harokopio University of Athens (a former partner in the INCA project), responded to the request and the author coordinated the organisation of seminars (in the university facilities) covering the whole management cycle of all three types of disasters. The organisation of seminars was based on the approach of the INCA project, while their interactive component was reinforced. Two questionnaires were completed by the pupils, one about the pre-disaster period and the other about the crisis period. Each questionnaire was filled both before and after the seminars. The questions aimed once more to check DRM knowledge before and after the seminars (with an emphasis on prevention) and identify changes in perceptions and awareness. Certain queries were aimed at judging pupils' relative trust in various sources of forest fire risk information.

Quantitative and qualitative analysis of the answers to the questionnaires confirmed and expanded the findings of the first experiment in Kalyvia municipality. The seminars improve pupils' knowledge easily but their perceptions are difficult to change because they depend on individual psychological factors, the family context and the school experiences of each pupil. The majority of pupils aged 12–14 years trust their family and school for risk information more than any other source. Also, while the majority feel certain about what to do in the event of an earthquake because of the relevant lessons and training they have had in school, this is not the case with floods and forest fires, for which an intensive educational and training effort should be undertaken, particularly towards prevention and preparedness. Finally, the majority of pupils trust collaboration between their school and a university as the basic source of knowledge and messages about disasters.

Changing cultures to promote risk prevention at the community, institutional and national levels is a long-term process that starts at school age and necessitates bridging of institutions' cultural divides.

5 Conclusion and recommendations

Multi-hazard events may include floods, fires, earthquakes or terrorist events and they all represent a challenge for societies and groups globally. Disasters usually have an impact on a population that is characterised by different levels of vulnerability due to people's education and culture. Disaster education and training therefore needs to work with a person-centred disaster approach that takes these educational and social variations into account. Given this, successful education and training needs to overcome top-down approaches, but emphasise collaboration and mutual learning, for instance through comprehensive policies reaching beyond individual nation states.

For several reasons, more often than not the risk culture and perceptions of broader societies, communities and risk-responsible organisations are biased towards an overemphasis on emergency response and disparagement of the criticality of prevention. In such cases not only more risk knowledge but also a change in the predominant culture is necessary. This can be achieved only through a long-term educating process that starts at school age (preferably) and presupposes bridging the divides between distinct and different organisational cultures. It can also be achieved by promoting cultural inclusion in all areas of the risk management system, which requires cyclical collective training programmes that engage all parties with the help of cultural intermediaries. Such promotions may also include hosting international events to integrate a variety of cultures and all social, ethnic and age groups, involving individuals and NGOs involved in DRM.

Research on disaster education and cultural inclusion is still an emerging field. There are to this date only a few large-scale collaborative projects that involve universities and public and private disaster organisations on issues around education and cultural inclusion. At the European level, there is no specific funding scheme that could support such research. This is particularly concerning because many public service providers, from fire services to schools, have collected considerable data that could be used to improve their service provision, but remain unexplored for lack or resources, skills and incentives to engage with that data.

References

Asgarya, A., Ghaffaria, A., Levyb, J., 2010, 'Spatial and temporal analyses of structural fire incidents and their causes: A case of Toronto, Canada', *Fire Safety Journal*, Vol. 45, No 1, pp. 44–57.

Bank of Greece, 2011, *The environmental, economic and social impacts of climate change in Greece* (in Greek), Athens, https://www.bankofgreece.gr/Publications/%CE%A0%CE%BB%CE%B7%CF%81%CE%B7%CF%82_%CE%95%CE%BA%CE%B8%CE%B5%CF%83%CE%B7.pdf.

BBC, 2018, 'Grenfell Tower fire: Who were the victims?', https://www.bbc.co.uk/news/uk-40457212.

Birkmann, J., 2007, 'Risk and vulnerability indicators at different scales: Applicability, usefulness and policy implications', *Environmental Hazards*, Vol. 7, No 1, pp. 20–31.

Camit, M., 2002, 'Smoke alarms wake you up if there's a fire: A smoke alarm campaign targeting Arabic, Chinese, and Vietnamese communities in New South Wales', *Social Marketing Quarterly*, Vol. 8, No 1, pp. 52–54.

Childs, M., 2005, 'Beyond training: New firefighters and critical reflection', *Disaster Prevention and Management: An International Journal*, Vol. 14, No 4, pp. 558–566.

ClimateChangePost, 2020, https://www.climatechangepost.com/about-us/.

Cohen-Hatton, S. R., Butler, P. C., Honey, R. C., 2015, 'An investigation of operational decision making in situ: Incident command in the U.K. Fire and Rescue Service', *Human Factors*, Vol. 57, No 5, pp. 793–804.

Cowell, A., 1997, 'With nearly 100 dead, floods keep raging in central Europe', *New York Times*, 21 July, https://www.nytimes.com/1997/07/21/world/with-nearly-100-dead-floods-keep-raging-in-central-europe.html.

Dean, E., Taylor, M. J., Francis, H., Clark, A., 2016, 'An exploration of community and culture related fire injury risks', paper presented at UKAIS, Oxford University, Oxford, UK, 12 – 13 April 2016.

Department for Communities and Local Government: London, 2011, *The Economic Cost of Fire: Estimates for 2008*, Fire research report 3/2011, DCLG Publications, https://webarchive.nationalarchives.gov.uk/20121105004836/http://www.communities.gov.uk/documents/corporate/pdf/1838338.pdf.

DiGuiseppi, C., Roberts, I., Wade A., Sculpher, M., Edwards, P., Godward, C., Pan, H., Slater, S., 2002, 'Incidence of fires and related injuries after giving out free smoke alarms: Cluster randomised controlled trial', *BMJ*, Vol. 325, No 7371, 995.

Douglas, M., Wildavsky, A., 1982, *Risk and Culture*, University of California Press, Berkeley.

Duncanson, M., Woodward, A., Reid, P., 2002, 'Socioeconomic deprivation and fatal unintentional domestic fire incidents in New Zealand 1993–1998', *Fire Safety Journal*, Vol. 7, No 2, pp. 165–179.

Fielding, J. L., 2017, 'Flood risk and inequalities between ethnic groups in the floodplains of England and Wales', Disasters, Vol. 42, No 1, pp. 101-123.

GFMC (The Global Fire Monitoring Center) and the Independent Committee of of Experts for the Investigation of Forest Fire Causes, 2019, *Report of the Independent Committe of Experts for the Investigation of Forest Fire Causes*, https://government.gov.gr/wp-content/uploads/2019/02/independent_committee-compressed.pdf.

Greiving, S., Pratzler-Wanczura, S., Sapountzaki, K., Ferri, F., Grifoni, P., Firus, K., Xanthopoulos, G., 2012, 'Linking the actors and policies throughout the disaster management cycle by "Agreement on Objectives" – a new output-oriented management approach', *Natural Hazards and Earth System Sciences*, Vol. 12, pp. 1085–1107.

Jones, S., 2019, 'Death toll rises as torrential rain and floods batter Spain', *Guardian,* 14 September, https://www.theguardian.com/world/2019/sep/13/torrential-rain-floods-spain-almeria-murcia-airports-closed.

Hagelsteen, M., Burke, J., 2016, 'Practical aspects of capacity development in the context of disaster risk reduction', *International Journal of Disaster Risk Reduction*, Vol. 16, pp. 43–52.

Harpur, A., Boyce, K., McConnel, N., 2014, 'An investigation into the circumstances surrounding elderly dwelling fire fatalities and the barriers to implementing fire safety strategies among this group', *Fire Safety Science*, Vol. 11, pp. 1144–1159.

Home Office, 2017, 'Fire statistics: Fatalities and casualties', https://data.gov.uk/dataset/f7ccba2d-f679-46e1-8d6d-de7bee690d40/fire-statistics-fatalities-and-casualties.

ICPDR (International Commission for the Protection of the Danube River), 2019, 'Welcome to Danube Day 2018/2019', http://www.danubeday.org/.

Johnson, V., A., Johnston, D., M., Ronan K., Peace, R., 2014), 'Implementing disaster preparedness education in New Zealand primary schools', *Disaster Prevention and Management*, Vol. 23, No 4, pp. 370-380.

Kalogirou, S., Sapountzaki, K., Tragaki, A., Varympopiotou, M., Daskalakou, E., Roussos, A., Tsagari, K., Xanthopoulos, Papachatzi, A., 2011, 'Report on implementation for forest fire risk reduction goals including an output tool and a continuation in the Eastern Attica

Region', Deliverable D.2 of the European Project INCA (Linking Civil Protection and Planning by 'Agreement on Objectives'), https://ec.europa.eu/echo/files/civil_protection/civil/prote/pdfdocs/2008_inca_final_report_en.pdfKrüger, F., Bankoff, G., Cannon, T., Orlowski, B., Schipper, L. E. F., 2015, *Cultures and Disasters: Understanding cultural framings in disaster risk reduction*, Routledge, New York.

Kundzewicz, Z. W., Szamalek, K., Kowalczak, P., 1999, 'The great flood of 1997 in Poland', *Hydrological Sciences – Journal des Sciences Hydrologiques*, Vol. 44, No 6, pp. 855 – 870, https://pdfs.semanticscholar.org/2adb/a6da3a1956a8edbdb6d4fcead4c6947747c8.pdf.

Lofstedt, R., 2005, *Risk Management in Post-trust Societies*, Houndmills, Basingstoke and New York.

Matczak, P., Lewandowski, J., Choryński, A., Szwed, M., Kundzewicz, Z. W, 2016, 'Analysing and evaluating flood risk governance in Poland: Looking for strategic planning in a country in transition', Report D3.6, STAR-FLOOD Consortium, Utrecht.

Michaels, S., 2015, 'Probabilistic forecasting and the reshaping of flood risk management', *Journal of Natural Resources Policy Research*, Vol. 7, No 1, pp. 41–51.

Mitchell, T., Haynes, K., Hall, N., Choong, W., Oven, K., 2008, 'The roles of children and youth in communicating disaster risk', *Children, Youth and Environments*, Vol. 18, No 1, pp. 254–279.

Morawski, A., 2014, Wykorzystanie potencjału organizacji pozarządowych w procesie zarządzania kryzysowego, Wydział Dziennikarstwa i Nauk Politycznych, Wydawnictwo Uniwersytetu Warszawskiego, Warszawa, http://wnpism.uw.edu.pl/wp-content/uploads/2019/08/Wykorzystanie-potencjalu.pdf

Morgner, C., 2017, 'Global media and time', *Studies in Communication Sciences*, Vol. 17, No 1, pp. 57–76.

Office for National Statistic, 2011, '2011 Census', https://www.ons.gov.uk/census/2011census

Otway, H., Wyne, B., 1989, 'Risk Communication: Paradigm and Paradox', Risk Analysis, Vol. 9, No 2, pp. 141-145.

Oxford, N.[@Natalie_Oxford], 2017, 'Grenfell Tower fire', [Tweet; photograph], Twitter, https://twitter.com/Natalie_Oxford/status/874835244989513729/photo/1

Państwowe Gospodarstwo Wodne, Wody Polskie, 2019, 'Relacja z inauguracji Informatycznego Systemu Osłony Kraju (ISOK)', https://kzgw.gov.pl/index.php/pl/aktualnosci/753-relacja-z-inauguracji-informatycznego-systemu-oslony-kraju-isok.

Perrow, C., 1984, *Normal Accidents: Living with high-risk technologies*, Princeton University Press, Princeton, NJ.

Preston, J., 2012, *Disaster Education: 'Race', equity and pedagogy*, Sense Publishers, Rotterdam.

Raadgever, T., Hegger, D., 2018, *Flood Risk Management Strategies and Governance*, Springer International Publishing, Utrecht.

Ramalingam, B., 2013, *Aid on the Edge of Chaos: Rethinking international cooperation in a complex world*, Oxford University Press, Oxford.

Sapountzaki, K., Varympopiotou, M., 2011, 'Validation of Concept', Deliverable E of the European Project INCA (Linking Civil Protection and Planning by 'Agreement on Objectives'),

https://ec.europa.eu/echo/files/civil_protection/civil/prote/pdfdocs/2008_inca_final_report_en.pdf

Sapountzaki, K., Wanczura, S., Casertano, G., Greiving, S., Xanthopoulos, G., Ferrera, F., 2011, 'Disconnected policies and actors and the missing role of spatial planning throughout the risk management cycle', *Natural Hazards*, Vol. 59, pp. 1445–1474.

Shah Alam Khan, M., 2008, 'Disaster preparedness for sustainable development in Bangladesh', *Disaster Prevention and Management*, Vol. 17, No 5, pp. 662-671.

Shaw, R., Shiwaku, K., Takeuchi, Y., 2011, *Disaster Education*, Emerald, Bingley, UK.

Tierney, K. J., 2007, 'Recent developments in U.S. homeland security policies and their implications for the management of extreme events', in Rodríguez, H., Quarantelli, E. L., Dynes, R. R. (eds.), *Handbook of Disaster Research: Handbooks of sociology and social research*, Springer, New York, pp. 405–412.

UNESCO, 2017, 'Cultural inclusion', http://www.unesco.org/new/en/social-and-human-sciences/themes/urban-development/migrants-inclusion-in-cities/good-practices/cultural-inclusion/.

Wachinger, G., Renn, O., Begg, C. and Kuhlicke, C., 2013, 'The Risk Perception Paradox—Implications for Governance and Communication of Natural Hazards', *Risk Analysis*, Vol. 33, No 6, pp. 1049-1065.

Walls, L., Revie, M., Bedford, T. (eds.), 2017, *Risk, Reliability and Safety: Innovating theory and practice: Proceedings of the 26th European Safety and Reliability Conference, ESREL 2016, Glasgow, 25–29 September, Scotland 2016*, CRC Press, Balkema, Netherlands.

Webb, J., Auckland, M.-A., 2013, 'Fire Kills campaign', presentation given at the Prevention, Protection and Road Safety Forum, Eastwood Hall, Nottingham, 27 February 2013.

Weick, K. E., 2010, 'Reflections on enacted sensemaking in the Bhopal disaster', *Journal of Management Studies*, Vol. 47, No 3, pp. 537–550.

Wisner, B., 2006, 'Self-assessment of coping capacity: Participatory, proactive and qualitative engagement of communities in their own risk management', in Birkmann, J. (ed.), *Measuring Vulnerability to Natural Hazards: Towards disaster resilient societies*, United Nations University Press, New York, pp. 316–329.