

TeMA

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Land Use, Mobility and Environment

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THE TIMES THEY ARE A-CHANGIN'

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Land Use, Mobility and Environment

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The cover image is a photo of impacts on transport infrastructure of typhoon Hagibis in Japan (October, 2019)

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MEGA-EVENT ORGANIZATION CONSIDERING SAFETY, SECURITY AND RESILIENCE

INSIGHTS FROM THE MILAN WORLD EXPO 2015 AND
LONDON OLYMPIC AND PARALYMPIC GAMES 2012

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ABSTRACT

Cities become globally significant and attract national and international interest from all over the world with the help of mega-events, such as World EXPO and the Olympic Games. Mega-events highly require the involvement of various actors working together for the same overall purpose, although these actors have the responsibility of diverse target groups and require to use different resources. In his paper, we aim to understand the role of organizations in mega-events in relation to the socio-technical systems they operate. We consider security, safety and resilience articulated in six areas: planning, construction of the site, training, collaboration, communication and legacy, in three different time slots: before, during and after the event. Results include insights to enhance multi-organizational culture-based practice. The field studies conducted in Milan in 2015 and 2016 on Milan World EXPO 2015, and in London in 2012 and 2016 on the London Olympic and Paralympic Games 2012. The research findings are based on the experience of the real actors involved in these two events. The findings suggest several courses of action for decision-makers and emergency planners to safety and security design strategies that can facilitate resilience as a legacy of a mega-event.

KEYWORDS:

Mega-event, Disaster Risk Reduction; Milan EXPO 2015; London Olympic Games 2012; Resilience; Safety; Security

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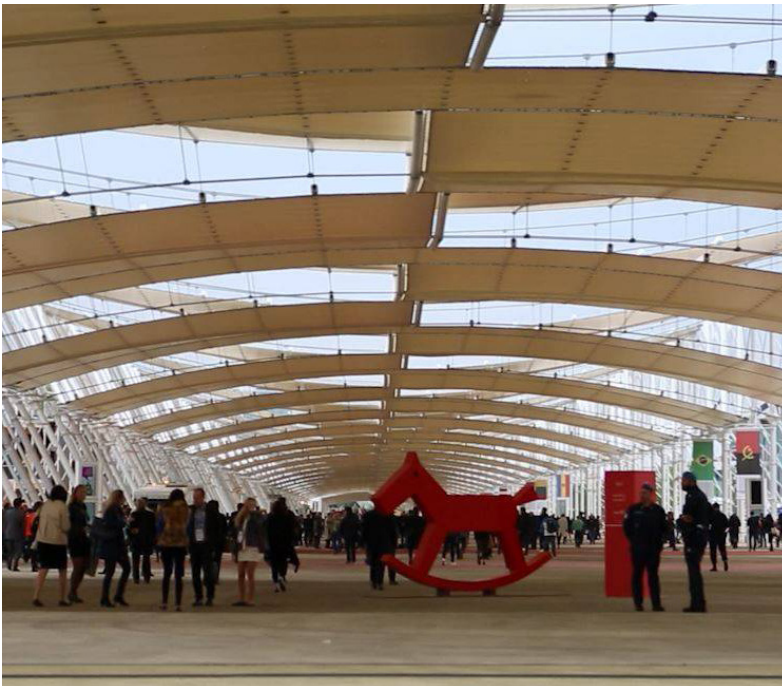
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考虑安全、保障和弹性度的 大型活动组织

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摘要

城市在世博会、奥运会等大型活动的帮助下变得全球知名，吸引来自世界各地的目光。为了实现共同的整体目标，大型活动离不开相关各方的参与，尽管这些角色承担的目标群体责任各不相同，并且需要使用不同的资源。在他的论文中，我们旨在了解组织在大型活动中与它们运作的社会技术体系相关的作用。我们认为安全、保障和弹性度体现在六个方面：规划、场地建设、培训、协作、沟通和遗产，并且分为三个不同的时间段：活动前、活动期间以及活动后。结果包括促进基于多元组织文化的实践的深入见解。2015 年和 2016 年在米兰对 2015 年米兰世博会以及 2012 年和 2016 年在伦敦对 2012 年伦敦奥运会和残奥会都进行了实地调研。研究结果基于两次活动的真实参与者的经验。研究结果为决策者和紧急事件规划者制定安全与保障设计策略提供了一系列行动方案，从而让弹性度成为大型活动留下的遗产。

关键词：

大型活动；减少灾害风险；2015 年米兰世博会；2012 年伦敦奥运会；弹性度；安全；保障

1 INTRODUCTION

Due to the wide range and scope of the events, it is difficult to provide a single definition of a mega-event. The categorization and definition of a mega-event may vary according to its rationale, frequency, and location (Edizel, 2014; Mazzeo, 2008; Smith, 2012). Getz (1991) defines mega-events as events with a global reputation attracting visitors to the host city to participate in sporting, cultural, religious and political activities, while Smith (2012) simply names mega-events as those which sell over a million tickets. Overall, mega-events are "high profile spectacles held in a limited time, which change the built environment, have global significance and attract national and international interest to the city" (Edizel, 2013). According to this definition, only three events can be named as mega-events: the Olympic Games, the World Expo and the Football World Cup. In this paper, we will focus on the Milan World Expo 2015 and the London Olympic and Paralympic Games 2012 as case studies.

Mega-events have been considered as an effective economic development tool by local and national actors all over the world since the early 1990s (Edizel, 2013). Hosting mega-events increases the appeal of both the host city and country by attracting international visitors and media attention as well as contributing to the regeneration of the built environment and enhancing the strategic organizational structure of the local area. However, there are important challenges related to hosting a mega-event, such as financing the event, environmental impacts, social dimensions or under-utilized facilities and safety, and security issues. For example, significant urban intervention associated with the 1992 Barcelona Olympic Games were seen to make a very direct contribution to redevelopment through the upgrading and rehabilitation of spaces in the city (Richards & Palmer, 2010). Indirect impacts of Barcelona Games include flagship buildings of internationally renowned architects and promotion of the city's architectural heritage as well as enhancements in public transport and redevelopment of the seafront which helped economic and social regeneration of the city (Julier, 2000). Although the 1992 Barcelona Games are accepted as a success story since the city used the Olympic project as a tool for long-term urban planning and made a positive transfer of the sports and other venues to everyday, community use (Monclus, 2011); they have also experienced facility under-use problems to a certain degree, and the 1992 Games only made \$3 million from \$10 billion invested (Coaffee & Johnston, 2007; Gastaldi & Camerin, 2018).

The study of mega-events is particularly an important area in the tourism and leisure literature (Chalip & Leyns, 2002; Richards, 1996). Along with tourism studies, the growing use of events as an economic development tool has grabbed the attention of researchers and policymakers. Some of the areas researched, which form the baseline of mega-event analyses include the cost of the event to the host nation, expenditures on bidding/preparation and revenues obtained from short-term and post-event stages (Burton 2003, Gratton & Henry 2001, Roche 2000). On the other hand, there has been increasing research on the spatial impacts of mega-events which consider post-event urban development and built environment/landscapes (Essex & Chalkley, 1998; Evans, 2011; Galderisi, 2008; Hiller, 1999; Smith, 2013). Approaching mega-events as a governance issue is a current research concern. Olympic governance and legacy have been studied from different perspectives in the 2000s (Burbank et al., 2001; Cashman, 2006; Edizel, 2013; Girginov, 2012; Poynter & MacRury, 2009; Smith et al., 2011). However, the discussion of the actors' involvement in a mega-event organization regarding security, safety and resilience is still missing from the literature.

Hence, this paper will provide a new insight from the perspective of the actors involved in the safety, security and resilience of mega-events, and some clues about the legacy for the continuation of the multi-organizational structure. The overall purpose of this research is to have a clear understanding of the role of organizations in relation to the socio-technical systems they operate and the reaction of users, such as visitors, exhibitors coming from different cultures, as well as the citizens, to any kind of disruption in the system.

The objectives are:

- having a critical understanding of the multi-organizational culture that has been formed during the preparation of mega-events;
- collecting information about ways to increase the effectiveness of those who respond to emergencies during mega-events;
- providing insights that can be used in different localities even after the completion of the event.

The paper includes information from two case studies: the London Olympic Games, 2012 and Milan EXPO 2015. We adapted a mutual learning approach while conducting the research by having meetings with the related actors and desktop research on the published reports, as well as emergency plans, risk maps and development plans of the municipalities involved in the organization of the mega-event.

1.1 INTRODUCING THE MILAN EXPO 2015

Milan hosted the World EXPO 2015 starting from May 2015 until the end of October 2015 for six months. "Feeding the Planet, Energy for Life" was proposed as the theme of EXPO 2015. The proposed theme had involved issues related to food shortages, food and food solidarity education, GMO, new technologies and innovation as well. The selected location for the EXPO exhibition area was the Rho area, in in the Northern part of the Milan Municipality. The main reason for selecting this area was the presence of infrastructures (highways, high-speed rail, regional rail system, the metro line), as well as the Rho Fair area.

Milan is the second-largest city in Italy with more than 1.3 million inhabitants within the city borders of Milan and more than 3.2 million inhabitants within the Milan Province (ISTAT, 2019). Although Milan is the second largest city in Italy, the Milan Province has a central role in the Italian economy due to its economic, cultural and political influence (Please see COMPASS project).

Milan is well-connected with Lombardy region, which has a population of around 10 million inhabitants that are distributed over an area of approximately 24,000 square kilometers. During EXPO both Milan and surrounding municipalities were affected by major urban transformation processes, such as the fifth metro line in Milan (Lilla), the extension of the bicycle path from Milan to the EXPO site and extending the bicycle fleet with electric bicycles, the Via Water project, which starts from Garbagnate. The latter is a water channel connected with a pedestrian and cycle path is used as an element of a promoter of extensive territorial rehabilitation.

EXPO was a 6-month length mega-event in Milan with the involvement of 134 countries, 5 international organizations and 21.5 million visitors from different countries (EXPO S.p.A., 2015). The Milan World EXPO 2015 was coordinated by the Prefecture of Milan, and the team involved all the related actors, such as civil protection, fire brigades, police, volunteers, ambulance services, Lombardy Region, Milan Municipality, etc., the organizations were grouped into sections, according to their functions in the COM (Central Operation Room) by considering the Augustus Method¹.

1.2 INTRODUCING THE LONDON OLYMPIC GAMES 2012

The London Olympic and Paralympic Games 2012 were staged between July 27th and August 12, 2012. With its 9.1 million population, London is ranked 27th in size by the year 2019 as the most populous metropolitan area in the World in the world's cities ranking (Office for National Statistics, 2019). London has always been a

¹ In Italy, Civil Protection has carried out its activities according to the "Augustus" method since its establishment in 1997. The Augustus method involves the setting up of up to 14 (regional and national) "support functions". F1: Planning and technique; F2: Health, social and veterinary assistance; F3: Media and information; F4: Volunteers; F5: Means and materials; F6: Transportation and viability; F7: TLC; F8: Essential services; F9: Damage assessment; F10: Operative structures; F11: Local authorities; F12: Dangerous materials; F13: Assistance to the population; F14: Coordination of operational centres.

city of spectacles, and the London Olympic Games 2012 event grabbed worldwide attention, following other events in the city. The Royal Wedding in 2011 was the first of this series of events where an extra 350,000 visitors came to the UK over the month of April compared to the previous year (ONS, 2012). The Diamond Jubilee on June 2012 attracted hundreds of thousands of visitors flowing in London's hotels, restaurants, bars and shops (Parker & Rainey, 2012). Government data showed that the UK welcomed 590,000 visits for either the Olympics or Paralympics, or attendance at a ticketed event, who spent an average of £1,290 during their visit compared with £650 by other visitors (ONS, 2012). The majority of these visits were to Olympic Park, which is in the Lower Lea Valley, one of the most deprived areas in the UK. The Lea Valley was subject to a major regeneration project with the arrival of the Olympic Games coming, which fast-tracked the regeneration of the area and drew investment from public and private sources. Olympics brought a considerable amount of infrastructure to London, besides unique venues and facilities.

However, there was a dark side to the event. Right after London was awarded the 2012 Olympic Games, a suicide bomber killed fifty-six people in London, which raised security concerns and underestimated the budget of the bid. In March 2012, the Government announced the revised Olympic budget as £9.235 billion for the construction and security costs, which were £5.3 billion higher than the bid stage (Evans & Edizel, 2016), and the initial security budget increased to £1 billion from £225 million (Coaffee & Fussey, 2016). In fact, the Metropolitan Police Authority stressed that the London Olympic and Paralympic Games 2012 required the largest security operation ever held in the UK.

Therefore, London 2012 involved several actors in delivering the Games successfully. The vision for London 2012 was on hosting "an inspirational, safe and inclusive Olympic Games and Paralympic Games and leave a sustainable legacy for London and the UK" (CSL2012, 2011). London 2012 actors wanted to inspire change in many ways. They aimed to demonstrate that the London Olympic Games 2012 would be about more than sport by including culture and education programmes with wider benefits like the Cultural Olympiad and beyond London, where the benefits and excitement were felt across the UK and around the world. The events were fully accessible to everyone via tickets to watch the Olympic competitions or via watching on TV or attending other Olympic-related events (festivals, cultural events).

2 MEGA-EVENTS IN LITERATURE

There is a wide range of urban events hence different event classifications according to their rationale and location help to define mega-events. Researchers use various indicators while making a classification of mega-events such as duration, size, scale, volume of visitors and prestige. Aiming to cover all important dimensions when defining the events, Jago and Shaw (1998) identify the key attributes of mega-events by making a detailed examination of the usage of different terms in event literature and introduced a typology of special event types. On the other hand, Getz (1991) considers this classification from the tourism perspective and identify the amount of attractiveness as the only indicator to categorize mega-events. He states that the definition must focus on the proportion and number of international visitors. From a different perspective, Roche (2000) considers three events as 'mega': The Olympic Games, the World Fairs (EXPOs) and the World Football Cup. His classification is related to this cultural context, such as target attendance, type of media interest and so on and his grouping of mega-events depends on ranking the events in accordance with their scale of significance. Considering all different classifications, only three events can be named as mega-events: the Olympic Games, the World Expo and the Football World Cup. This paper will focus on two of them as case studies: Milan World Expo 2015 and London Olympic Games 2012.

Up until the 1990s, mega-events are mostly studied by tourism researchers regarding visitor numbers, iconic venues and economists regarding the cost-benefit analysis. Although it has a long history, the spatial dimension of mega-events only received attention after the 1990s. Using events to promote urban

development gained significant importance, especially after the 1992 Barcelona Games, which is accepted as a successful example, mega-events had started to be even more associated with their impact and legacy on the urban environment. It is fair to claim that the events before the 1930s did not aim to leave a permanent legacy in the built environment (Monclus, 2011) in a holistic way, but only specific urban problems are addressed through the event, such as infrastructural development and legacies; for example, the 1900 Paris EXPO and 1935 San Francisco EXPO. Public-private partnerships started to grow in the 1990s. Events were used to regenerate post-industrial cities since the main strategy of the 1990s period was reinventing cities rather than building on existing strengths. In the 2000s, events gained importance as a catalyst for urban development. While the events of the nineteenth century were more about displaying technology and trade (e.g., EXPOs), celebrating arts and culture (e.g., Garden Festivals) and establishing links between different cultures and nationalities via sport (e.g., Olympics), city authorities had started to approach these events as an opportunity to introduce their regeneration plans in recent decades.

Regenerating the host city through culture rather than the desire of putting on a good show has become the main purpose. Gold and Gold (2005, xii) also support this approach by stating "it may be an exaggeration to say that promotion of culture has become the preferred route for regenerating ailing economies, but its importance cannot be minimised". In the early 1930s, the regeneration benefits of mega-events, especially the EXPO and Olympic Games, were mostly associated with the physical infrastructure projects. However, after the 2000s, mega-events target not only interventions to the physical environment, but social, environmental and economic problems are also pointed as a part of the sustainability and legacy plans of mega-events (Fussey et al., 2011; Pitts & Liao, 2009). Therefore, Olympic-led regeneration can be a part of Getz's sustainable events since he defines sustainable events as not only the ones that can endure indefinitely but also ones "that fulfil important social, cultural, economic and environmental roles that people value" (Getz, 1997). This comprehensive approach to mega-events has become more visible after the 2000s.

Recently, hosting mega-events is claimed to bring several social benefits to the host communities. According to Ritchie (1984), mega-events offer at least two important benefits to community development; the first one being the reinforcement of the social fabric of the community through better quality of personal relationships derived from the extensive volunteer efforts frequently associated with the event, and the second one being the possibility of reinforcing activities and behaviours that can contribute to the community culture. According to anthropologists Kroeber and Kluckhohn (1952) culture involves all the materials and spirituality created by human and added to the nature. On one hand culture is a dynamic notion that can be traced by perceptions, on the other hand cultural legacy in a society determines specific norms and rules (Kroeber & Kluckhohn, 1952). As Ritchie (1984) states, mega-events can be catalysts of change both in the community culture and organizational culture.

Today, one of the biggest challenges of the world cities is to host people from different backgrounds (Sassen, 1991). Mega-events are tools to promote community cohesion with the help of the high level local involvement, such as volunteering (Smith, 2012). Roche (2000) notes that EXPOs and the Olympic Games, "together with the event movements and networks and cycles connected with them, decisively influenced and helped create a new level and form of international public culture." Therefore, mega-events are considered as a powerful method for promoting versions of citizenship, social cohesion and cultural inclusion (Misener & Mason, 2006; Mohan & Mohan, 2002; Roche, 2000; Smith, 2012). However, there is also considerable controversy about the extent that mega-events create community cohesion and inclusion.

On the other hand, another challenge is to meet resilience targets, while hosting a mega-event, due to the increased exposure of the population that involves both residents and visitors coming to the event. That increase in exposed populations that are coming from different cultures does not necessarily add new risks but concentrates the current risks in the city in one place. Hence, disaster risk reduction (DRR) that should

consider the increased exposure to enhance the resilience of the current infrastructure systems. There are also other issues, such as the new risk landscape, including terrorism, traffic jams and changing hazard conditions that increase the vulnerability of cities and the multiple interaction patterns of infrastructure systems.

Therefore, to obtain a mega-event, improving the structural condition of a city is not sufficient, it is necessary to ensure a well-maintained infrastructure system. Providing resilience against disruption to infrastructure and services is also vital to ensure the functions of the mega-event, to guarantee competitive advantage of the host city, as well as ensuring the safety and security of infrastructures.

Both Milan EXPO 2015 and London Olympic Games 2012 welcomed international attention in terms of visitors, volunteers and investors. While this diversity celebrated the multi-cultural spirit that these events target, the cities also become more vulnerable to outside threats. Both Milan and London had gone through significant infrastructure and service improvements in order to deliver the mega-events in a resilient way.

3 METHODOLOGY

Milan EXPO 2015 was a case study in EDUCEN Horizon 2020 Project to investigate the relation of organizational culture and mega-events from the perspective of safety, security and resilience. The case study was supported by the interviews with people who were actively involved in the preparation of the Milan World Expo 2015 and the London Olympic Games 2012. Both events were analysed using a qualitative approach. Interviews were targeted to discover information about safety, security and resilience notions. Questions were directed to reach the related information in previously defined sections. Semi-structured interviews were conducted face to face in the working environments of the interviewees. The primarily collected data supported by the reports and scientific literature.

In Tab. 1, we matched the objectives with methods and related activities. As a part of EDUCEN Horizon 2020 project, organizing a workshop on mega-events in Politecnico di Milano was one of the main activities in addition to interviews. On one hand, the workshop in Milan provided the opportunity to learn more about the stakeholders' experience, on the other hand, being in one location for two days let them exchange their experience and ideas.

OBJECTIVE	LAYER / PATTERN	METHOD	ACTIVITIES
Understanding the way that the multi-organizational culture has been formed	Multi-organizational pattern	Secondary data collection	Literature study on mega-events regarding
		Primary data collection in Milan	Interviews with the representatives of organizations who were actively involved in Milan EXPO 2015
		Primary data collection in London	Interviews with the representatives of organizations who were actively involved in the London Olympics
Lessons Learned - effectiveness	Multi-organizational pattern & Spatial Layer	Primary data collection and analysis	Analysis of innovative information sharing strategies
Lessons learned – gathering insights	Multi-organizational pattern & Spatial Layer	Primary data analysis	Transcription of interviews

Tab.1 Table OBJECTIVES. Source: adapted from EDUCEN Project Deliverable 7.5, 2017

For Milan World Expo 2015, we contacted with the representatives from the Lombardy Region Fire Brigade, the Municipality of Milan, and the Prefecture of Milan. To collect information on London Olympic and Paralympic Games 2012, we conducted interviews with the members of resilience team, emergency personnel, London Fire Brigade, and the Resilience team from Transport for London. Conducting interviews helped us to understand the differences between what was planned following the normative patterns, and the reality

occurred during the event. Indeed, the findings of the case study suggest several courses of action for decision-makers and emergency planners.

Interviews were conducted in London by one of the authors using open-ended questions. The purpose of the conducting interviews was to understand the differences and similarities between organizations that were involved in safety and security planning before, during and after the mega-events. In tab. 3, we listed the organizations and the role of the interviewed people. In tab. 4, there are all the open-ended questions that were asked during the interviews.

METHODOLOGY	RATIONALE
Workshop in Milan in March 2016 All presenters had 8-minute time-slot during the workshop	Participants from Milan: all the organizations which were involved in preparation and management of the Milan Expo 2015. (EXPO 2015 SPA, Milan Prefecture, State Police, Milan Municipality, Medical Emergency, Milan Firemen Department, Lombardy Region, Regional Department of Fire Brigade of Lombardy). Participants from London: one speaker for each subject (safety, security and resilience), including the Ex-Met Police Department Security Design Advisor, an expert on Safety Management involved in preparation of the Games, and Head of the Resilience Planning in Transport for London during the Games (TfL).
London Olympic and Paralympic Games 2012	We involved the London Olympic and Paralympic Games 2012 in the EDUCEN project as a good case to collect more information on the issue. We had a site visit to London on June 2016. We conducted in depth interviews with representatives from the London Resilience Team, London Fire Brigade, London Metropolitan Police, two London Boroughs and Transport for London (resilience team, London surface travel, London tube network).

Tab.2 Additional data collection activities. Source: adopted from EDUCEN Project Deliverable 7.5, 2017

ORGANIZATION	THE ROLE OF THE RESPONDENT
London Fire Brigade	Contingency Planning, Operational Resilience Group Manager
London Resilience	Exercise Unified Response Command Post Exercise Lead London Resilience Officer London Fire Brigade
London Underground	Line General Manager Piccadilly Line, London Underground
Transport for London - Resilience	Head of Resilience Planning Transport for London
Transport for London	Resilience and Business Continuity Manager, business recovery and business continuity activities
Transport for London	Resilience Training and Exercises Manager who delivers command and incident management training and desktop and seminar exercises for Surface Transport
ODA - Security	Security boss
A borough	Emergency Planner
Transport for London	Events Planning Manager, London Buses, Surface Transport

Tab. 3 The list of the organizations where the interviews were conducted in London in June 2016. Source: adapted from EDUCEN Project Deliverable 7.5, 2017

ASPECT		QUESTION
Background information	The background of the respondent	What is your role in this organization? What was your role during the mega-event (such as London Olympic Games or Milan EXPO)?
Planning	Planning: the first step to enhance the resilience of society against natural and man-made disasters.	What were the specific objectives? Do you think that considering culture in DRR is relevant in mega-events? How can you anticipate and identify solutions or cultural problems that may arise in the event of an emergency?
Collaboration	Mega-events are organized and governed by the several and heterogeneous organizational coalitions working at and/or responsible for different spatial or temporal scales.	With whom did you collaborate? According to your observation, what are the differences in the operational culture between the different institutions (such as local authorities, rescuers, etc.)? What is the set of procedures/configurations/institutions involved?
Communication	New crisis management tools to communication & cultural aspects in communication.	What is the best way to convey messages to people during emergencies? What are the impacts of cultural aspects on the effectiveness of risk communication? Have you ever encountered any specific problems related to specific/diverse cultural aspects? Which cultural factors, important insights, specific communication styles for a given cultural group should be taken into consideration during disaster situations in an urban area?
Learning		What was the worst thing that happened? How did you respond? How do you define the success of the mega-events? What did you learn? What were the benefits/advantages/problems which were identified? What would you do differently if it happens again?
Effects / Legacy		How did your planning/routines change after the mega-event?

Tab. 4 Questions asked during the interviews. Source: adapted from EDUCEN Project Deliverable 7.5, 2017

4 INSIGHTS

Although this research focused on Milan World EXPO 2015 and London Olympic and Paralympic Games 2012 as case studies, the insights could also apply to a wider level of mega-events and may help policymakers develop strategies for safe, secure and resilient events. Therefore, assessing how organizers can enhance the safety, security and resilience with the help of development principles in event-led regeneration is the main contribution of this research to knowledge.

Safety: It is about the protection of people and properties from hazards caused by incidents. According to one respondent, in such big events, however, absolute safety is not possible (interview with an officer of the fire-brigade, June 2016, London).

Security: It means the protection of people and properties from external threats and terrorist attacks, which has become a central issue while budgeting mega-events following 9/11 attacks. Security is on the concern of the organizers during the construction of the event site before the event starts. Security measures include all the issues to protect the construction site before and during the event against any kind of attack. An ex-

military officer who was responsible for the security of the Olympics in London mentioned the difficulty of the issue by saying that “you need to find the right balance between making people alert and interested in security and not alarming them” (interview with an ex-military officer, June 2016, London).

Resilience: Mega-events’ resilience means, first, being able to keep the event functioning even after potential incidents. Second, a mega-event can help to promote resilience through international programs as well. Especially a World EXPO about nutrition and sustainability shall contribute to making environmentally effective development strategies. According to one of the officials from Milan, auto-protection and accepting the inevitable phase of chaos are the keys to resilience. As it is mentioned in Norton et al. (2015) to achieve resilience it is necessary to consider the knowledge and information channels through networks as their capability to bring stakeholders together to share experiences, increase the knowledge base, and thus facilitate improved decision-making by stakeholders in policy and practice.

The notions in this research are articulated in six main groups: planning, construction of the site, training, collaboration, communication and legacy, in three different time periods; before, during and after the event (Fig. 1).

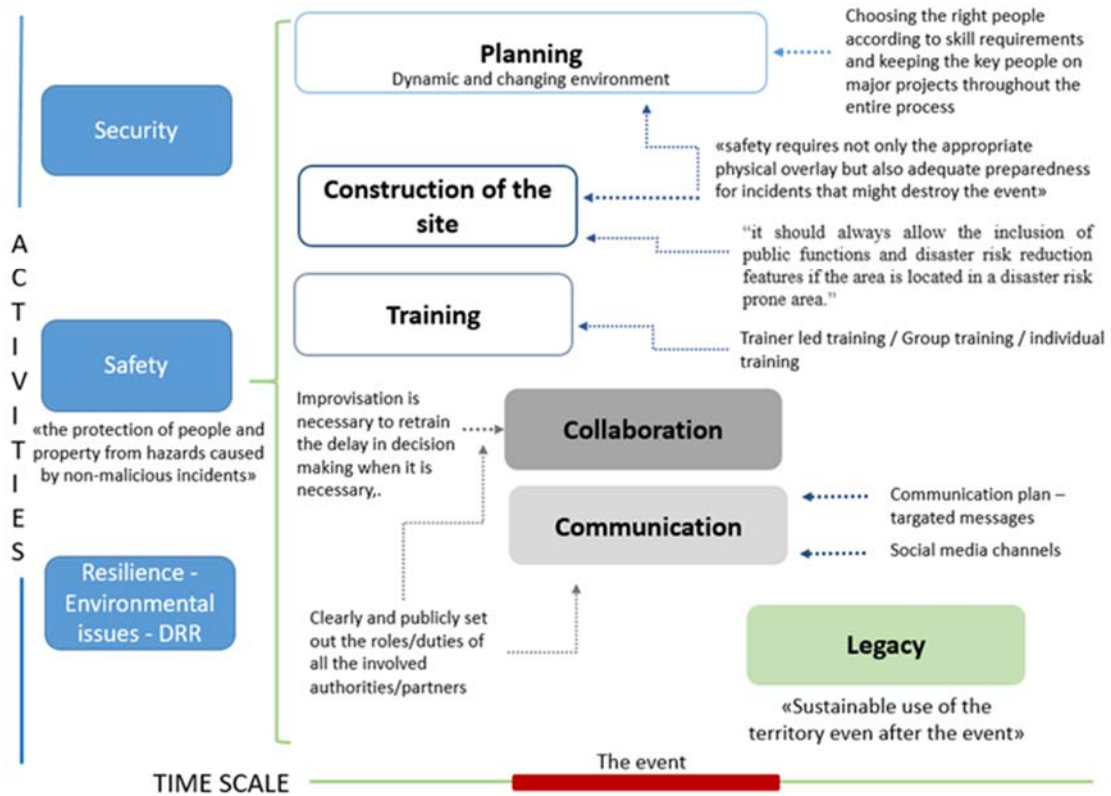


Fig. 1 The systematic schema of the activities and timing in mega-events (Source: EDUCEN Project Deliverable 7.5, 2017)

4.1 DISRUPTIONS/EMERGENCIES DURING THE EVENT

In the case of Milan World EXPO 2015, the potential flood risk maps, potential industrial accident information and emergency plans were already ready before the event. The 24h/7days surveillance-camera service in the center was in place to monitor the real-time traffic flow together with the geo-referenced vehicles. These biometric cameras were directly connected to the database. Additionally, excellent signalization of Ferrovie Nord (rail-road company) was ensured by the surveillance-camera service. During the event, the team in Milan had to deal with two big challenges. One of them occurred in August 2015. The Regional Civil Protection Authority was having a big wave of migrants (in total 1 million) in the central train station of Milan (from an interview with a regional civil protection official, February 2016, Milan). The second challenge was the blockage

of the railway system in August 2015 due to a broken train at the railway before Florence. All the trains passing through Florence returned to Milan Central Station together with their 1,500 passengers. The mobility plan helped the authorities to handle these challenges. Through the mobility plan, they alerted the central train station and all the taxis. All passengers were successfully placed in hotels at between 23:30 p.m. – 03:00 a.m. (interview with a Fire brigade officer, February 2016, Milan). In London, respondents did not report a big challenge, some incidents in the vicinity of the Olympic Stadium and an abandoned bag by journalists.

4.2 PLANNING OF THE EVENT

Definition of organizations, selection of personnel, preparation of budget and timing are the planning activities. Choosing the right people according to skill requirements and keeping the key people on major projects throughout the entire process are essentials of a successful planning. The budget estimation is a challenge in the planning of mega-events. Especially due to increasing security cost. According to one of the respondents, who is responsible from the security, the main tendency in such events is underestimating the cost of a mega-event and overestimating the funding (House of Commons, 2007). Timing is another issue that can pave the way to success or failure. In both events, respondents were agreed on the success of the definition of roles/duties of all involved authorities/personnel. However, as an official from the fire brigade in Milan mentioned that being able to improvise is necessary to be quick in decision-making for a timely response to an incident (interview with a fire brigade officer, February 2016, Milan).

4.3 NEW CONSTRUCTION

Newly constructed areas must include disaster risk reduction norms as a part of all development and infrastructure system investments to increase the resilience of the systems. The maximum building rights and any specific requirements and rules should be included in the plans for the areas of transformation. It is a must to pay more attention to requirements and rules in a disaster risk-prone area. Additionally, the newly developed areas and the increased number of people create new risk landscapes, including terrorism, traffic jams and changing hazard conditions that increase the vulnerability of the city and infrastructure systems. Other issues are cultural heritage, agricultural land and environmental and water resources. It is crucial to consider the integration and enhancement of policies in development plans to ensure coordinated actions for the development of sustainable use of the territory.

4.4 TRAINING

Technology, which has zero cost in some of the cases, might be the solution to every problem according to a respondent from Milan (interview with an emergency officer, February 2016, Milan). However, he continued saying that the main problem is the involvement of human error. To decrease the risk of human error, in Milan they conducted at least ten drills with a blind control station to test the communication system before the event. Training and drills helped them to test the system, as well as learning their role and what to do. Additionally, they knew each other and built trust between officials from different organizations during training and drills.

4.5 COLLABORATION

Activities, therefore, requires high level of collaboration. Almost all the respondents mentioned that trust is the key to flexibility during collaboration and communication activities. In addition to trust, innovative IT tools play a vital role in supporting the organization and operation activities. It is important to involve all the stakeholders, independent from their role at different temporal and spatial scales, in the meetings and during

the decision-making processes. Besides, the actors should be organized according to their target group and context.

As it is mentioned in the training section, trust building starts before the event on vertical and horizontal levels between actors. That helps to achieve an understandable, co-produced, shared knowledge, and, most importantly flexibility when a decision has to be made rapidly in an urgent situation. Another issue mentioned by respondents is that the importance of being in contact with actors from different practical backgrounds, such as academia, businesses and NGOs.

ACTIVITY	TIMING	AUDIENCE	KEY-ISSUE	GUIDELINES
Planning	Before and during the event	Prefecture Civil Protection Municipalities Public and private bodies that are involved in the planning of the event	Security and safety	<ul style="list-style-type: none"> - Selecting the right people according to their skills - Keeping the key people on major projects throughout the entire process - Inclusion of both public and private authorities in the estimation of budget - Improvising when necessary
Construction of the site	Before the event	Municipalities, planners, architects and engineers	Security	<ul style="list-style-type: none"> - Improving the safety of facilities - Making disaster risk reduction a part of all development and infrastructure related investments - Coordinated actions for development should consider sustainable use of the territory
Training and drills	Before the event	Prefecture Civil Protection Municipalities	Security and safety	<ul style="list-style-type: none"> - Learning roles and duties - Knowing each other - Building trust
Collaboration	During the event	Public and private bodies that are involved in the planning of the event	Security safety and resilience	<ul style="list-style-type: none"> - Extensive engagement of people, including the public - Involvement of all the governmental authorities - Involving communication and transportation agencies in the plan - Building synergy; having a common purpose
Communication	During the event	Public Prefecture Civil Protection Municipalities	Security and safety	<ul style="list-style-type: none"> - Flexibility - Trust building - Enhanced data grouping methods - Supporting traditional media with social media - Civil servants as volunteers communicate with public in the event area - Multi-ethnicity practice
Legacy	After the event	Public Prefecture Civil Protection Municipalities	Resilience	<ul style="list-style-type: none"> - Increased visibility in the social media, increased potential to reach a wider public even after the completion of the event - Increased use of innovative technology - Testing the current safety and security mechanisms - Regeneration and renewal of deprived areas - Enhanced tourism potential - Volunteer teams still active in the case of large events - Sustainable use of the event site - Improved supply conditions, enhanced visibility

Tab. 5 Insights. Source: adapted from EDUCEN Project Deliverable 7.5, 2017

4.6 BETTER COMMUNICATION

In the Milan World EXPO 2015, the communication plan was established before the event by considering the current one, which was a communication system between the municipality and the province. Through this system, they were able to deal with ordinary information. For emergencies, they issued a communication protocol that had to be signed and filled in by prefecture and all the other related institutions. It was updated every 1.5 and 3 hours after inserting the information into the common platform. Then, a situation report was prepared continuously according to the collected data. In communication, the key message was "filtering the data" to be able to find particular information when it is necessary. As data arrives casually, the huge amount of collected data could turn into a big challenge. The state of the emergency declaration was via SMS, and the dissemination of warnings was via megaphones. Inside the EXPO area, the organizations had their own systems to warn people. Additionally, there was a connected video and radio communication system inside and outside the EXPO area.

4.7 LEGACY ACHIEVEMENT

Increased tourism potential in the medium- and long-term, the introduction of advanced technology in certain areas, being able to test current safety and security mechanisms are some of the legacies that cities gained by hosting a mega-event. Indeed, mega-events are engines of urban developments and regeneration of deprived areas. Moreover, due to organizations' active accounts in social media, the public have learned more about the organizations and followed them through social media channels even after the completion of the event. Besides, in both cases, the volunteer teams, which were created during the event, are still active in case of big concerts, or necessity. A well-organized mega-event is helpful for the formation of human capital. If the social inclusion strategy is adapted well during the implementation phase of a mega-event, the labor market can be adapted and allow access to those from a lower social status as well.

5 CONCLUSION

To conclude, the paper includes two different mega-events, one of them is the Olympic and Paralympic Games in which visitors are accumulated within a short period of time, less than a month. On the other hand, a World EXPO is also considered as a mega-event due to the duration of the event, which is 6 months. Both examples provide opportunities in terms of economic and spatial development in their host cities and require several institutions working together in harmony before, during, and even after the event.

The purpose of this study was threefold. First, understanding how the multi-organizational culture has been formed during mega-events; second, how to increase the effectiveness of responders to disasters with the multi-organizational interaction takes place during mega-events; third, providing insights considering different phases of a mega-event (i.e. before, during and after) on safety, security and resilience of main activities and the event itself.

Indeed, mega-events involves multi-organizational interaction that takes place among public and private organizations. These organizations behave in a casual manner and share their experience and knowledge before, during and even after the event. Therefore, a mega event helps to strengthen the multi-organizational culture due to the high level of collaboration through mutual knowledge sharing about the norms and resources of each organization. As a result of this high level of collaboration, a common terminology can be established, and several communication tools and methods can be evolved during the management of a mega-event. As we saw in London case, the constructed multi-organizational culture remains stable and continuous over time even after the mega-event as a result of the new norms and agreements that have been formed among organizations.

Although mega-events are the main concern of tourism and leisure literature as an economic tool, recently, it has also entered into disaster risk and resilience studies as a research topic.

The reason is that mega-events have been considered as a tool that is strengthening cooperation and collaboration among multi-organizations, which is an essential asset for disaster risk and resilience studies.

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IMAGE

Fig. 1: EDUCEN Project Deliverable 7.5. Atun, F., Menoni, S. (2017), Mega-event (Milan-EXPO) Case Study Manuel, EDUCEN Project: European Disasters in Urban centres: a Culture Expert Network (3C – Cities, Cultures, Catastrophes).

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