POLITECNICO DI TORINO
Repository ISTITUZIONALE

Above and below equator

Original
Above and below equator / Comino, J., Fantoni, D., Fresca, G., Scholl, S., Tortajada, Eva. - In: Heritage at Risk Improving Resilience and Awareness towards Preservation, Risk Mitigation and Governance StrategiesELETTRONICO. - [s.l] : CRC Press Taylor & Francis Group, 2025. - ISBN 978-1-032-86785-4. [10.1201/9781003530787]

Availability:
This version is available at: 11583/3004064 since: 2025-10-15T14:52:25Z

Publisher:
CRC Press Taylor & Francis Group

Published
DOI:10.1201/9781003530787

Terms of use:

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright
Taylor and Francis postprint/Author's Accepted Manuscript con licenza CC by-nc-nd

This is an Accepted Manuscript version of the following article: Above and below equator / Comino, J., Fantoni, D., Fresca, G., Scholl, S., Tortajada, Eva. - In: Heritage at Risk Improving Resilience and Awareness towards Preservation, Risk Mitigation and Governance StrategiesELETTRONICO. - [s.l] : CRC Press Taylor & Francis Group, 2025. - ISBN 978-1-032-86785-4. [10.1201/9781003530787]. It is deposited

(Article begins on next page)

27 November 2026

Heritage at Risk – Balzani et al. (Eds)
© 2025 The Author(s), ISBN: 978-1-032-86785-4
Open Access: www.taylorfrancis.com, CC BY-NC-ND 4.0 license

Above and below equator

Jessica Comino*
URD, Politecnico di Torino, Italy

Duccio Fantoni
AUID, Politecnico di Milano, Italy

Giulia Fresca
National Technical Team Civil of Protection Department, Cosenza-Rome, Italy

Silvia Scholl
UN-Habitat, Beira, Mozambique

Eva Tortajada
Universitat Politècnica de València, Valencia, Spain

ABSTRACT: The conception of Global North is referring, from geographical point of view to the Northern Hemisphere located above the Equator and the Global South, but the expression is more used to describe a grouping of countries along socio-economic and political characteristics. The namely the part of the earth below the Equator is transforming more and more. Major dynamics of historical, post and new colonisation, greater economic discrepancy, politics power and subsequent accessibility to resources have created and engendered throughout the years the geographical difference. These phenomena inevitably lead to different approaches in spatial planning, territorial governance and particularly, in emergency assessment. This paper illustrates two different approaches to deal with natural hazards that occurred, one in the Global South, specifically the 2019 Tropical Cyclone Idai in the central area of Mozambique, along with the 2016 massive earthquake that took place mainly in the city of Amatrice in the central region of Lazio (Italy). This study seeks to investigate both hazardous events in their overall occurrence, focusing on the undertaken emergency approaches and the variety of difficulties encountered along these two challenging processes of recovery: geographical and geomorphological intrinsic features - the presence of the Indian Ocean and the configuration of the Mozambican country, so as the disposition of the Italian country over the Eurasian and African plate, resulting in a consistent number of faults throughout Italy -, multi-level approach of administrative sectors, legal framework and community awareness. This parallel discussion will eventually highlight the need to improve communities and professionals' preparedness, learn from previous mistakes, capacity building and raise awareness towards more conscious, fairer strategies to tackle emergencies. To this end, the main advantages identified in the BIM technology that could make major changes in this field, are certainly interoperability and the possibility of simulating the work process in a virtual way, using a constantly updated template. These and other innovative aspects will be discussed and analysed.

Keywords: Capacity Building, Emergency Management, Global North, Global South, Natural Hazards

*Corresponding author: jessica.comino@polito.it

DOI: 10.1201/9781003530787-56

1 INTRODUCTION

Traditional architecture has evolved to intimately relate social and economic imperatives with the specific needs of a cultural milieu[1]. Adapting to its environment during centuries, it has become an excellent example of sustainable and efficient architecture able to withstand the climatology of a location and specific risks. Current climate change intensified the frequency and formation of some natural threats[2], such as the cyclones in regions of Sofala and Manica (Mozambique), as well as the earthquakes in Amatrice (Italy) that repeatedly occurred during the past centuries. In both cases, traditional buildings adapted to its natural disasters and every culture generated a succession of guidelines for recovery after a disaster.

In the Global North, a globalised architecture has developed where new technologies and materials were introduced. Specialised technicians manage, control and adapt the buildings, laws and normative to improve environments pre and post disasters. On the other hand, in the Global South people live in strong communities whose know-how is essential in order to adapt traditional buildings according to the hazards. Their capacity to create networks between citizens and institutions is an advantage to implement rapid resilient reconstruction interventions and facilitate social mitigation post-disaster effects. Both sides of the world manage a post-disaster event in a very different manner, according to their acquired knowledge over the centuries. These good practices can be learnt and possibly applied to the other side of the world so as to manage the threats and weaknesses they may have.

2 METHODOLOGY

A comparison has been made between two cases, above and below the equator. Amatrice represents a global north world village located in Italy, which has been affected by several earthquakes during its history. Sofala and Manica regions represent two global south areas located in central Mozambique where mostly tropical cyclones, among other hazards, repeatedly reach their territories with a growing frequency.

The investigation analyses the strengths and opportunities, weaknesses and threats for both areas, according to the political situation, economical deals of a disaster and new technology applied pre and post hazards to avoid social exclusion and depopulation of the area and return to normal life as quick as possible, in terms of minimum life-condition and primary services in the initial responding phase, with the goal of rehabilitated and/or reconstructed building and a full reestablishment of the services in the long term response.

Different approaches take place during the recovery of the affected areas and its inhabitants, and both outcomes are compared in order to find a possible solution to the weakness previously found for the other side of the world.

3 AIMS

The current investigation compares the different approaches to reconstruction, particularly the actions taken towards the recovering of normal living conditions; in the global north public services are in charge of inspecting, monitoring and rebuilding, while in the global south the aim is to train the communities to rebuild in a more resilient and durable way. Aim of this analysis is to underline the importance of sharing knowledge, expertise, as well as the involvement of the communities in the decision-making[3] so to detect solutions to both weaknesses and threats each side of the world has according to their exposure, configuration and culture. Some of the proposals to improve the management of a post disaster event can feasibly be found in the opposite part of the world.

4 CASE STUDY

4.1 *Global North. Amatrice earthquake study case*

The 2016 earthquake in central Italy was chosen for the Global North. Although the area of the seismic crater was vast, we decided to focus our attention on the city of Amatrice. On 24th of August 2016, a magnitude of 6.2 earthquake struck central Italy, to the southwest of the town of Norcia. The earthquake's epicentre was at a shallow depth of only 5.1 km. It was the strongest earthquake to hit Italy since the 2009 L'Aquila earthquake, when over 300 people lost their lives in the earthquake measuring 6.3 on the Richter Scale.

The Amatrice earthquake was felt over 100 miles away, in Rome. The town of Amatrice experienced a range of primary and secondary effects that had a range of social, economic and environmental impacts. To understand the effects of the earthquake (Table1), it is necessary to know the reasons and causes.

Italy lies on the collision border of the Eurasian and African plate. As a result, Italy is riddled with faults. Two major fault lines are running through Italy, the north-south fault and the east- west fault. As a result of this, the country is being pulled and pushed in several directions. The Apennines, a mountain range that runs down the middle of Italy, is being stretched in a north- west direction at a rate of around 3 mm per year.

Pressure builds along the fault and, when released, causes earthquakes. The shallow depth of the earthquake, the focus was just 5.1km deep, led to severe damage on the surface, particularly in the towns of Amatrice, Accumoli and Arquata del Tronto. As the earthquake struck at 3.36 a.m., most people in the area were asleep in buildings that collapsed.

Table 1. Effects of the Amatrice earthquake.

Primary Effects	
a	Two hundred ninety-nine people lost their lives, 400 were injured, and 4454 were made homeless.
b	293 historic buildings were damaged or destroyed including the Basilica of San Francesco in Amatrice
c	Over half the buildings in Amatrice were damaged or destroyed. Despite their reinforcements, 80 percent of the buildings in the old town were affected.
d	Although the government allocated €1 billion for building improvements since the 2009 L'Aquila earthquake, many properties did not meet seismic building standards. The uptake of the funding had been low.
e	Despite being restored in 2012, the school in Amatrice collapsed, indicating substandard building practices.
Secondary Effects	
a	Landslides blocked roads, making access to the area difficult
b	Local residents suffered psychological damage
c	Individuals were reported to have been involved in looting
d	Unsafe buildings led to the town center being cordoned off. This had a negative impact on tourism.
e	Ninety percent of barns and stalls for sheep, goats, and cattle in the affected area were destroyed, alongside the mechanical milking systems As a result, farmers struggled to milk by hand, leaving their cattle at risk of mastitis, an udder-tissue disease. Farmers struggled to make a living in the aftermath of the earthquake

It has been estimated 13,000 people experienced severe ground movement for around 10-20 seconds and more than 200,000 would have felt strong tremors. By 29th of August 2016, there had been about 2,000 aftershocks, some as strong as magnitude 5.5.

It is also worth noting that Amatrice, which usually has a population of 2,500, was about to celebrate its fiftieth annual food festival, so there were additional visitors in the town at the time. In the early hours of 24th of August, following the first 6.2 magnitude earthquake, immediate inspection was undertaken of all Mobile Network Operators (MNO), network equipment to assess functionality of fixed telephone communications, mobile, and internet, identifying no damage to networks. The assessment of the infrastructure was reported to the National Civil Protection Service (Protezione Civile); the institution - formed in 1992 - responsible for the prevention of various types of risk and for the coordination of activities needed to overcome emergencies. MNOs immediately made contact with the Joint Operating Committee, established by the National Civil Protection Service, to create a channel of communication with all internal units performing emergency-related activities. All MNOs provided special emergency equipment, including fixed and mobile communications located at the relief centres.

4.2 *Immediate Responses*

Over 10,000 homeless people were accommodated in 58 tents. Sports halls were converted to provide shelter and hotels on the Adriatic coasts were used to temporarily house people.

Many rescue workers arrived within an hour of the earthquake. 5000 soldiers, alpine guides, and the Italian Red Cross were involved in searching for survivors, providing food and water, and supplying tents. Seventy dog teams and twelve helicopters were involved in the rescue effort.

Six of the Vatican's 37 firefighters have travelled to Amatrice to help civil protection workers look for survivors.

A temporary hospital was set up and patients at Amatrice hospital, which was severely damaged during the earthquake, were transferred to a nearby hospital in Rieti.

Appeals were made by the national blood donation service to ensure demand was met. Safety check features were activated by Facebook, so local people could inform family and friends they were safe.

The local population removed their passwords from wi-fi at the request of the Italian Red Cross in order to let rescue teams communicate more effectively.

Funds of 50 million Euros for emergency response were announced by the Italian Government. The taxes for residents were cancelled and reconstruction work began immediately.

4.3 *Long Term Responses*

Students were educated in neighbouring schools while 12 classrooms were constructed in prefabricated buildings in Amatrice. Six months following the earthquake, the government promised to move people from temporary camps into wooden houses.

The cost of rebuilding was reduced by tax incentives, allowing 65 percent of total renovation costs to be used as tax breaks.

Villages were rebuilt, with the building of the same character through a 42 million Euros by government initiative called 'Italian Homes'. A year on, 2.4 million tons of debris and rubble remained in the areas affected by the earthquake.

The emergency response of the National Civil Protection Service was coordinated by the National Civil Protection Department (DPC) until 7th of April 2017, when the administrations of the four affected regions took over the management of most of the ongoing emergency activities. Meanwhile, the reconstruction process started on 9th of September 2016, when a special commissioner for the reconstruction was appointed by the President of the Republic.

Besides search and rescue, civil protection activities were focused on assisting the population, by providing shelters and food. Up to 4,807 people were assisted in the first few days. At the end of August 2016, 43 tent camps had been set up, but their use was limited to a few weeks and then they were replaced by containers, because of the cold weather in the epicentral areas, while most of the population was f hotels in the Adriatic coast.

Prevention and mitigation strategies have always been strongly influenced, in Italy, by the occurrence of catastrophic events. After the Mw 6.9 Irpinia earthquake in 1980, a new classification of the national territory was adopted and, in 1982, the DPC was established. During the Mw 5.9 Umbria–Marche earthquake emergency in 1997, the civil protection system positively tested both its organisation and a new technical emergency management system. After the Mw 5.7 Molise earthquakes in 2002, a Prime Minister's ordinance enforced new seismic classification and seismic code aligned with the European Code (EN-1998, 2004). It also established that strategic and important public buildings and infrastructures had to be subjected to safety evaluations. The Mw 5.9 Emilia earthquake in 2012 boosted initiatives for resilience improvement in the private production sector. Finally, after the central Italy 2016–17 sequence, technical standards were updated, and tax incentives for seismic retrofitting of private buildings were introduced, based on their risk classification. Introducing compulsory seismic risk insurance for residential property, would allow the Italian state to save progressively money paid for damage and then invest more in prevention.

According to the Italian Senate (Senato della Repubblica – Ufficio Valutazione Impatto, 2017), about 75 % of the 13 billion Euros of the budget allocated for the reconstruction is devoted to infrastructure and real-estate assets. A large amount of the budget (c. 20 %) is also committed towards the resumption of economic activities and supporting the economic needs of the population.

4.4 *Emergency and reconstruction management are closely related*

- Many of the choices made in the emergency phase can affect the success of the reconstruction and vice versa, as they are partly overlapping in time and activities. At the national level, this was managed through close relations between the civil protection and the special commissioner for the reconstruction. Similarly, continuous and close collaboration is needed among the national, regional and local levels of governance on the reconstruction process. The interventions must be compatible with the protection of the architectural and environmental aspects, to obtain eco-sustainable architecture and energy efficiency and the reconstruction process must take into account the need for reinterpretation of the landscapes.
- Population ageing, the depopulation of some areas, the effectiveness of educational and health infrastructures, and either a cohesive or a disintegrated social fabric affect earthquake impacts. The discovery of the different dimensions of the vulnerability of communities adds knowledge necessary to promote resilience, i.e., the ability to channel community energy and territorial resources positively. Social and psychological aspects are important components of this vulnerability. They are analysed and taken into account in Italy, for instance to prepare a more effective emergency management.
- The principles for the analysis, conservation and structural restoration of architectural heritage state that each intervention should be in proportion to the safety objectives set, thus keeping intervention to the minimum to guarantee safety and durability with the least harm to heritage values.

The impact of the 2016–2017 moderate to strong earthquakes on assets and communities was high. The recurrence of strong earthquakes for 5 months made the emergency and recovery phases extremely complicated, and time has turned out to be critical owing to multiple socioeconomic and other external factors. Damage and safety assessment is crucial for both phases, since its outcome is needed to ensure safety and the continuity of residence, schooling and production, especially by zootechnical firms in the central Italy case. This continuity and effective infrastructures are fundamental to avoid depopulation and to support a prompt recovery to normal life conditions.

In this case study, the repeated infrastructure disruptions over time called for continuous adaptation of the response, and public–private cooperation was very useful to handle infrastructure disruption and recovery.

Structural prevention is sorely needed, especially because of the high vulnerability of old masonry buildings. Special attention is required when energy efficiency upgrading is carried out. A specific comprehensive plan is especially needed to seismically upgrade the huge number of inadequate schools within a reasonable time.

Cultural heritage requires a great effort in the emergency phase, not only to secure damaged immovable assets but also to recover cultural and architectural remains from collapsed heritage buildings for future restoration work.

Disaster risk reduction, and particularly structural prevention, is one of the most important general policy targets to be implemented in the coming years. Discovering different dimensions of the community's vulnerability adds knowledge that is necessary to promote resilience. Emergency and reconstruction management are closely related. Many of the choices made in the emergency phase can influence the success of the reconstruction and vice versa as they are partly overlapping in time and activities.

Not all issues related to the disaster caused by the 2016–2017 central Italy earthquakes could be considered in this chapter. However, the wide variety of issues discussed provides an example of complex emergency management, prevention activities and governance at national and European levels, and shows how long the process is to reach an effective disaster risk reduction strategy.

4.5 *Global south. Tropical cyclone Idai study case*

For the Global South, the chosen case study was the Tropical Cyclone Idai in 2019, that turned the spotlights of the world's media on Southern Africa, specifically Mozambique and its neighbouring countries, Malawi and Zimbabwe. Tropical Cyclone Idai made landfall on the night of 14th to 15th March 2019 at Beira City, Sofala Province, in Central Mozambique. The Cyclone brought strong winds (180 – 220 km per hour) and it was followed by heavy rains (more than 200 mm in 24 hours) across the provinces of Sofala, Manica, Zambezia, Tete and Inhambane, causing rivers to overflow, with flood waters reportedly rising by 10 metres. Idai also brought a large storm surge in the coastal city of Beira and surrounding areas of Sofala province. Six weeks later, it was followed by another cyclone, Kenneth, impacting mainly the northern part of the country, especially Cabo Delgado Province. These two events were ranked among the top five worst cyclones to ever hit Mozambique. They provoked catastrophic flooding, killing over one thousand people, displacing dozens of thousands, and affecting close to 2.2 million people in total. Cyclones Idai and Kenneth caused an unprecedented amount of losses and damage.

Contextualising the country, it is important to highlight that the Republic of Mozambique has an estimated population of 27,909,798 with a population density of 36.1 per square kilometres[4]. The country is divided into 11 Provinces and 154 Districts. The country had a GDP of billion in 2017 which grew at 3.3% in 2018 and prior to the cyclone was projected to marginally improve to 3.5% in 2019[5]. The country has a tropical climate that is predominant in the north, and also experiences dry weather in the south. These climatic conditions have influenced epidemiologic patterns with seasonal malaria, meningitis, cholera and other diarrheal diseases[6].

The cyclone impacts demonstrate that the majority of houses and as well as public infrastructure like schools or health centres in Mozambique are built with inadequate materials and not to resilient construction standards. We can find many reasons for these results. A large part of the public infrastructure was built with so many different projects, partners, lack of technical oversight, projects not appropriate for the geographic area, mediocre quality of material and execution. Suffice it to say that before the initiative of *Safer School*, the Ministry of Education used to build schools all over the country with the same executive project, even if the country is large and with a very diverse geography, open to different hazards, such as cyclones, drafts, heart quakes and floods. In some areas there is also an overlap of them (Figure1)

Most of the cyclone damage to infrastructure was caused by wind, emphasising the importance of increasing resilience to wind hazard and heavy rain. Due to climate change, Mozambique is exposed to increasingly frequent and extreme cyclones.

Indeed, Mozambique is nestled within the South-Eastern African region, whose hydro- geographical profile is strongly characterised by the presence of the massive water extension of the Indian Ocean and by nine international river basins flowing through the country, among which the Zambezi is the largest one, followed by the Limpopo, Rovuma and Save.

The presence of the Indian Ocean is the main cause of the generation of high intensity storms and tropical cyclones, which are the most serious threat for the region as a whole and for Mozambique in particular, since they also trigger torrential rains causing devastating floods. For a cyclone to generate, warm, moist air over the ocean rises upwards from near the surface, creating an area of lower air pressure below. Warmer ocean temperatures allow stronger storms to form, and the South Indian Ocean is warming rapidly, because of the effects of gradual warming on a global scale, which has resulted in a net increase in ocean temperatures. With the acceleration of climate change effects, temperatures of 30°C are occurring more and more often and over longer periods of time, hence storms and cyclones are growing stronger in intensity and frequency.

After cyclone Idai, in order to let the machine of humanitarian aid work, it was necessary to wait until the president had declared the state of emergency. So, it is just after this declaration that the United Nations and other organisations can enter in action, managed by UN Agency OCHA (Office for the Coordination of Humanitarian Affairs) who create the organisation groups divided by sectors called clusters (i.e., Education cluster, Health cluster, etc.).

4.6 *Immediate Responses*

Just a month after the cyclone, in April 2019, the institution "Gabinete de Reconstrução Pós Ciclones" (GREPOC) was established to coordinate the reconstruction. GREPOC coordinated the Post Disaster Needs Assessment that served as a basis for the Beira Donors' Conference, organised by GREPOC at the end of May 2019. Then, GREPOC coordinated the preparation of the Disaster Recovery Framework (DRF) known as the PREPOC (Programa de Recuperação e Reconstrução Pós-ciclones) which was issued in August 2019 and served as a framework to prepare Post-Cyclone Housing Program (PALPOC), aiming to create the conditions to support households and communities to reconstruct. The Mozambican government elaborated and approved the Disaster Recovery Framework – DRF, where there are prioritisation criteria, the immediate recovery priorities, the implementation challenges etc. Based on the result of the PDNA (Post-Disaster Need Assessment) it was estimated that the damages and losses were over 3 billion USD. The tropical cyclone Idai was a disaster of epic proportions, probably one of the worst ever recorded in the region.

The plurality of needs assessments (not just about infrastructure, but also from agriculture point of view, social and psychological aspects etc.) produced a plurality of different results. About the damage assessment, the lack of information about the construction history of the building (who built, in which year, was the executive project deposited somewhere or not etc.) made the work more complicated. Most of the buildings were just built with spontaneous architecture, not following any resilient construction rules at all.

4.7 *Long Term Responses*

Building resilience is a summary of the respect of different conditions: adequate executive projects respecting the zone hazard conditions, correct orientation and localization, suitable construction materials, quality of the materials, quality of the work execution, adequate execution oversight to control all the process. The normative changed according to the elaboration of Multi-Hazard Map in 2016, that recognized different 6 zoning according to the 4 hazards. After the tropical cyclone Dineo in 2017, the normative elevated, for example, the limit for resilient roofs (that it was previously 180km/h) to 210 km/h. In several sectors it is now

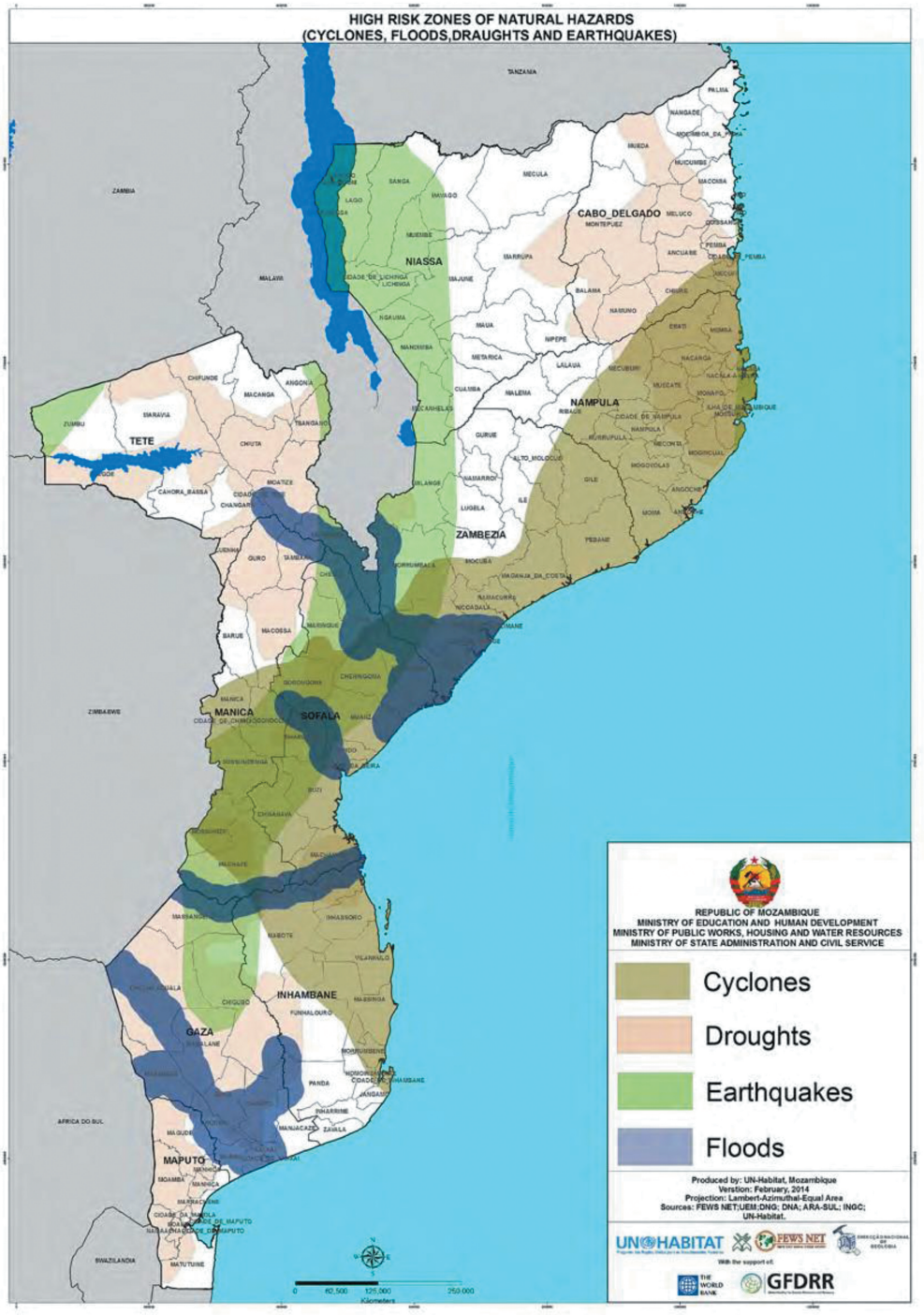


Figure 1. High risk zones of natural hazard in Mozambique, UN-Habitat, Mozambique, 2014.

mandatory to respect the guidelines regarding resilient buildings and use of certificated materials. During these hard times between Covid-19 pandemic, the several natural hazards that hit Mozambique after-Idai (Cyclones Kenneth, Chalane, Eloise, Ana, Goma etc.) there were some really positive signals to a desire to change perspective. The most significant one is the introduction of the Ministerial Diploma n° 122/2021, published in "Boletim da Republica", Serie I, n° 206, made that resilient constructions are mandatory in Mozambique for the educational sector. The BBB "Building Back Better" methodology has been finally recognized as the winning one, understanding the importance of resilient reconstruction and prevention. The main challenge will be about the real control, about Monitoring & Evaluation (M&E) of each post-disaster project, that involves construction, the hardest part is to make the normative respected and to verify the real implementation of this important strategy.

The diffusion of the BESP, Basic Emergency Scholar Plan, was also a big result, but it needed to be extended, all over the country. In the health sector, there is not still a similar document, but it is work in progress. After 3 years from the disaster, Mozambique is in the recovery phase and it is where it is necessary to continue with advocacy in order to change the construction habits at different levels, build resilience in several fields such as public infrastructure, housing, food security etc. linking the Sustainable Development Goals (SDGs), Agenda 2030 and Sendai Framework.

The Mozambique case shows lack of diffusion of technical knowledge, challenging data information management and a lack of strategic prevention plan in many sectors. Simply transform construction or rehabilitation into resilient (re)construction, learn how to "live with disasters", with the change of construction habits also thanks to the networks as the communities are.

Learning processes are the solutions. Capacity building and technical training about resilient construction for bidder, oversight companies, academia, NGOs, governmental technicians, etc. together with on-the-job-training during the construction works is the key to show and pretend durable solutions. Reconstruction and rehabilitation processes that do not respect resilience are an enormous loss of money. It is needed to break the cycle of never-ending construction and reconstruction. According to UNDP and OCHA, since 2000, almost 1 million of people have been killed, over 2 billion were affected, over then 1 trillion of dollars were lost, but only 1% of international aid money was spent to reduce the impact of disasters. When just 10% would protect development gains and save thousands of lives and billions of dollars. Every 1 dollar spent on preparedness, save 6 dollars in response[7].

5 CONCLUSION (DISCUSSION)

The comparison between the two study cases chosen has highlighted the importance of context in the development of strategy of disaster risk reduction, preparedness and recovery reconstruction. In this case, the contextual contingencies consist not only of physical and geographical conditions, but rather of an overlapping of cultural, normative and administrative processes. Resilience approach impacts especially on the improvement of the effective intervention methodologies, but also in the reduction of negative impacts and risks in case of future disaster for communities. The comparison between the two study cases underlines the possibility to tackle the challenges of post-disaster in respect of peculiar context. The role of a resilient approach takes on extremely different characteristics with respect to the dynamics already present in the area, which can be emphasised or reversed depending on the management of the after-damages phase. The Italian case study for global north is emblematic from the perspective of processes such as depopulation and population ageing. In relation to this, the earthquake highlighted the efficiency of the first response, but it accentuated the fragility of the built heritage with respect to these events and accelerated the socio-economic crisis of the area in the long term. The case study of Cyclone Idai in Mozambique, for the global south, is a significant example of the importance of implementing (re)construction based on the specificity of hazard mapping and zoning, however as intervention with preparedness methodologies and strategies where a complexity of conditions overlaps. The introduction of

specific normative for resilient building, in a context of mainly informal and spontaneous construction, marks a change of perspective in an area plagued by several natural disasters. In conclusion, the shared potential of the two case studies is the role of communities in implementing resilient disaster prevention and response policies. The need to embed this approach in a vision that starts from the needs of the local area remains the most important challenge, both in the global south and the global north.

AUTHORS CONTRIBUTION

Abstract: J.C.and D.F. investigation, resources, writing and editing, S.S. editing Introduction: E.T writing, J.C. and S.S. editing

Methodology: E.T investigation, resources and writing, S.S. and D.F. editing Aims: E.T investigation, resources and writing, S.S. J.C. and D.F editing Study cases:

- "Global North. Amatrice earthquake study case" G.F.: investigation, resources, writing, S. S. editing
- "Global south. Tropical cyclone Idai study case" S.S.: investigation, resources, writing and editing
- "Conclusion": D.F.: investigation, writing, S.S. writing and editing

NOTES

[1] Vellinga, M., Oliver, P., & Bridge, A. (2007). *Atlas of vernacular architecture of the world*. Routledge.

[2] Mileto, C., Fernando Vegas López-Manzanares, María Lidón de Miguel, & Escobar, A. H. (2022). *Guest editorial: Vernacular architecture: sustainability and risks. Journal of Cultural Heritage Management and Sustainable Development*, 12(2), 89–91.

[3] Oliver, P. (2006). *Built to meet needs: cultural issues in vernacular architecture*. Architectural Press.

[4] INE, Mozambique, "Preliminary Results of National Population Census" http://www.ine.gov.mz/operacoes-estatisticas/censos/censo-2007/censo-2017/divulgacao-osresultados-preliminares-iv-rgph-2017> [accessed 2 May 2019].

[5] The World Bank, "Mozambique Data", 2019 https://data.worldbank.org/country/mozambique> [accessed 2 May 2019].

[6] Ministry of Health, *Health Sector Strategic Plan, 2014-2019* (Ministry of Health, Mozambique, 2014).

REFERENCES

Baggio, C., Bernardini, A., Colozza, R., Corazza, L., Della Bella, M., Di Pasquale, G., Dolce, M., Goretti, A., Martinelli, A., Orsini, G., Papa, F., Zuccaro, G., 2007, *Field Manual for post-earthquake damage and safety assessment and short term countermeasures (AeDES)*, European Commission – Joint Research Centre Institute for the Protection and Security of the Citizen, published in Italy, 100 pages, ISSN .

Celano, F., Cimmino, M., Coppola, O., Magliulo, G., Salzano, P., 2016, *Report dei danni registrati a seguito del terremoto del Centro Italia del 24 agosto 2016* (Release 1), http://www.reluis.it/images/stories/Centre%20Italy%20earthquake%20damage%20report%20-%20R1.pdf

Cosenza, E., Del Vecchio, C., Di Ludovico, M., Dolce, M., Moroni, C., Prota, A., Renzi, E., 2018, "Le linee guida italiane per la classificazione del rischiosismico delle costruzioni: Principi tecnici e validazione", *Bollettino di ingegneria sismica*, vol. 16, pp. 5905–593, DOI: 10.1007/

Boncio, P., Lavecchia, G., Pace, B., 2004, "Definizione di un modello di sorgenti sismogeniche 3D per applicazioni di valutazione del rischio sismico: il casodell'Appennino centrale (Italia)", *Journal of Seismology*, vol. 8, pp. 407–425. 10518-018-0431-8.

Di Bucci, D., Savadori, L., 2018, "Definire il livello di rischio accettabile ai fini della protezione civile: una prospettiva comportamentale sulla decisione processo", *Pericoli naturali*, vol. 90, pp. 293–324, DOI: 10.1007/s11069-017-3046-5.

Djalante, R., Thomalla, F., 2011, "Community resilience to natural hazards and climate change impacts: A review of definitions and operating frameworks", *Asian Journal of Environment and Disaster*

Management (AJEDM) - Focusing on Pro-Active Risk Reduction in Asia 01/2010, vol. 3, n. 3, DOI: 10.3850/S1793924011000952.

Dolce, M., Di Bucci, D., 2018, 'The 2016–17 Central Appennines sismic sequence: Analogies and Differences with recenti terremoti italiani', in: Pitilakis, K. (a cura di), *Recent Advances in Earthquake Engineering in Europe*: *16th European Conference on Earthquake Engineering – Salonicco 2018*, *Geotechnical, Geological and Earthquake Engineering*, No 46, Springer, Cham, pp. 603–638, DOI: 10.1007/978-3-319-75741-4_26.

Commissione Europea, 2020, *SERA - Seismology and Earthquake Engineering Research Infrastructure Alliance for Europe*. https://cordis.europa.eu/project/id/730900.

Mileto, C., Fernando Vegas López-Manzanares, María Lidón de Miguel, & Escobar, A. H. (2022). *Guest editorial: Vernacular architecture: sustainability and risks. Journal of Cultural Heritage Management and Sustainable Development*, 12(2), 89–91.

Oliver, P. (2006). *Built to meet needs: cultural issues in vernacular architecture*. Architectural Press. Osservatorio Sisma, 2018, *Lo stato di avanzamento dei lavori nelle aree colpite dal Sisma* 2016–2017, Osservatorio

Sisma, Fillea-CGIL, Legambiente, 2018/12, http://osservatoriosisma.it/wp-content/uploads/2018/12/OsservatorioSisma-StatoavanzamentoDicembre2018.pdf.

Pessina, V., Hailemikael, S., Buffarini, G., Bernardini, F., Camassi, R., Del Mese, S., Ercolani, E., Fodarella, A., Locati, M., Martini, G., Paciello, A., Paolini, S., Arcoraci, L., Castellano, C., Verrubbi, V., Stucchi, M., 2019, "La sequenza sismica 2016–2017 nell'Italia centrale: rilievo macrosismico e scenario di danno attraverso la valutazione dell'intensità EMS-98", *Bollettino di ingegneria sismica*, vol. 17, n. 5, pp. 2407–2431.

Vaudo, G., 2018, "Sisma centro Italia: Peculiarità nel supporto psicologico", *Rivista di Psicologia dell'Emergenzae dell'Assistenza Umanitaria*, vol.19, pp. 6–9, http://www.psicologiperipopoli.it/files/Numero%2019%20vau.pdf.

Vellinga, M., Oliver, P., & Bridge, A. (2007). *Atlas of vernacular architecture of the world*. Routledge.