

Catalysing informal community development after natural disasters / Eefje Hendriks

Architect or policy maker?

The Dutch have a saying, “God made the earth, but the Dutch made the Netherlands.” Yes, I come from the Netherlands, a country with a quarter of our land below sea level and where every square metre has been carefully planned by one government agency or another. This is the result of fighting a centuries-long battle to reclaim land from the sea through an intricate system of dikes, canals, and pumps. Through fighting this battle, formality and *long-term planning* in the Netherlands has become an institutionalised response to the constant threat of the sea.

What do I know about informal settlements? Although I am proud of the liveability of my small country, with its dense urban network of small cities well connected by excellent public transport and with the countryside always within a half-hour bike ride, I lack excitement for the over-regulated public space. Against all odds, I became intrigued by problems related to *informal settlements* through my work experience in Buenos Aires in 2011, where I worked on *urban planning, slum integration, and slum upgrading*. Experiencing the chaos of informal settlements was an eye-opening experience for me and marked a stark contrast with the well-regulated Dutch landscapes that I have grown up with.



Slum upgrading in Buenos Aires (photo: Eefje Hendriks)

I would love to have a bit of chaos in our cities, where inhabitants would grab opportunities to use leftover spaces to make them their own. Initiatives that you commonly find in *informal settlements* or, in some cases, to a certain extent, that pop up in Dutch cities. It fascinates me when inhabitants *take control* over their built environment with structures that most Dutch architects and designers have unlearned to desire. Luckily, in the Dutch discourse of *city making*, the active involvement of inhabitants has become a priority on the agenda. It is those pop-up solutions in empty industrial buildings or wastelands, built with a high degree of reused materials, that have become an essential part of the popular *hipster movement* in the Netherlands. You almost can’t have a popular bar without at least reclaiming old school chairs and having tables made out of scrap wood. The hipster movement exemplifies the growing involvement of the users in not only the furniture but also the infill, building, tissue, and urban street level, which has been described as essential for city making by professor John Habraken (Habraken 2003). The Dutch now embrace this type of organised chaos in our cities, but how

does our perspective inform the development of informal settlements in rapidly growing cities around the world?

Many architects strive to become a *starchitect*, bringing impressive and carefully designed buildings into our built environment. Although it is incredibly exciting to have drawings and models come to life in real scale within our daily environment, it now feels *meaningless* to me to invest time towards building an environment that is already close to perfect. Why design breath-taking luxury buildings when some do not even have a basic roof over their head? Is that not the essential preoccupation and *responsibility* of a building engineer?

After a day of constructing houses in the slums of Buenos Aires, Argentina, I was overwhelmed by the abundance of delicious food we had on our dinner table in our *luxury* apartment, made by our friends from all around the world. Being aware that the families we had worked for, so close to our home, did not have enough made me and my roommate feel guilty. I felt guilty in having so many opportunities to develop myself compared to those living in the *periphery of the city*. Getting to know the families personally and living in the same city evoked more intense feelings than studying the slums in Mexico City for two weeks with my university. At that dinner, I became convinced that I would dedicate my privileged position to create opportunities for others. Because of my strong belief in contributing, I was at first amazed by the heated debate about the slums and its *social, economic, and political complexity*, not common in Western Europe. Despite all of our hard work, with elections coming up in Argentina the slum conditions remained unchanged. Politicians were struggling to find solutions that were acceptable to both the large number of slum dwellers living on illegal grounds and the wealthy and powerful tax-paying inhabitants. If I would want to contribute to better *living circumstances in the slums*, I would also have to be involved in *politics and policy making* and come with strategic solutions that fit the often contradictory needs of *stakeholders*. Architects and urban planners should always consider the right to the city (Lefebvre 1996) and how all urban actors can be involved in planning the city. In this article, I will take you on a journey around to world in a quest to contribute with architectural knowledge to the housing solutions of low-income groups, mainly living in informal settlements.

Where disasters create informal settlements

While studying to become an architect, I became fascinated by the problems that occur when *rapidly growing cities* with their informal settlements have to cope with natural disasters. Haiti has a broad history of recurring natural disasters, such as tropical storms, floods, and earthquakes, and is therefore in a constant state of rebuilding and development. The Haitian government has been poorly prepared for natural disasters. Since Haiti’s independence in 1803, the political situation has been a mess, partly because of a large French colonial debt, plenty of coups, and some ruthless dictators. Already before the

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earthquake in 2010, the very unstable Haitian government had to cope with *social inequality* partly due to the *rapid population growth* and the *lack of affordable living spaces* for the poor. Haiti was, and still is, one of the poorest countries in the world. Because of limited financial resources, the initiatives of slum dwellers to build their own houses were inevitable necessities to provide for the *lack of affordable housing*.

Just after the earthquake in Haiti in 2010, people found temporary shelter in the large city parks and voids, after having lost their homes and family members. *Informal tent camps rapidly and spontaneously* emerged all over the Haitian capital of Port-au-Prince. In these camps, new social relationships were made, and little by little, by people who were starting to rebuild their lives. A substantial amount of disaster survivors hesitated to move back to their former homes. Among other reasons, they feared the *unsafe construction*, the voodoo in Haitian culture implying beliefs of ghosts wandering around houses, or simply because there was nothing left to go back to or no money to rebuild with. So, people survived with what the camps had to offer, even though these internally displaced people lived in *hazardous living conditions* in an *uncertain, volatile, and precarious situation*. The tent camps in Port-au-Prince were especially known for their poor conditions for women and children, as they feared molestation, rape, and human trafficking.

Self-recovery transforming emergency tent camps into permanent settlements

Over time, some tent camps, such as Villa Rosa in Port-au-Prince, slowly turned back into the permanent informal settlement with *low quality* dwellings from before the earthquake. Villa Rosa was located on a hillside overlooking the city with a densely populated urban fabric of narrow streets. It was heavily hit by an earthquake, and a third of the houses were destroyed beyond repair. Efforts of NGOs, among others, willing to provide assistance were staggered because of land tenure, a complex and time-consuming risk assessment of the area, and the indecisive government in providing a formal reconstruction proposal. Unfortunately, because of the absence of engineers supporting the owner-driven reconstruction, the new houses were still lacking earthquake- and hurricane-resistant construction techniques and were built on a steep hillside with an irregular composition of soil endangering them to landslides. The shanty town Villa Rosa slowly returned to the same state as before the earthquake, and in 2015, almost five years after the earthquake, Villa Rosa had become a developed informal settlement, with even concrete houses, albeit still partly evicted.

Although an incredible amount of NGOs had been involved in the recovery of Haiti, people were still living in makeshift housing in former tent camps for years. Such transformations of tent camps are not exclusively seen in Haiti but occur worldwide where a disaster strikes in *low-income countries* with *highly dense urban areas*, where *adequate alternatives* are insufficiently provided by the government or NGOs.

Commonly, the permanency of tent camps is seen as a treat rather than as a solution for *low-income groups*. The treat is found in the little strategic and hazardous site selection and the extremely poor living conditions. It sounds cruel, but was it in some cases not also a good sign that people took fate into their own hands? Do we not want to build our cities with its inhabitants? Especially in a post-disaster situation as in Haiti, where everything was destroyed and the government lacked the financial means to provide alternatives, the initiative

of inhabitants should be appreciated. These settlements can also be regarded as an expression of *active citizen engagement* and an opportunity for new city development, which could lead to more self-reliance. Their involvement gives a *notion of creativity and socially and culturally embedded city making* processes. Could we support their initiative with guidance in *resilient city making*? Does the *top-down* organisation of city making usually lead to more liveable cities than being driven by *bottom-up initiatives*?

I was surprised by the fact that new neighbourhoods were constructed by NGOs in the *outskirts* of Port-au-Prince, like in camp Corail-Cesselesse, without affordable access to economic activity in the city. These groups in particular need the *proximity of the city* to provide their livelihood. I questioned the impact of this exclusion on the self-reliance of these inhabitants and decided to propose an *alternative strategy* for the informal tent camps of Port-au-Prince. What if we could support the tent camps in becoming part of the city, in parallel do what we did in Buenos Aires, Argentina?

What if self-recovery is supported?

Especially in academic institutions, we have the opportunity to propose innovative forms of *democracy in the city* and alternative approaches. I graduated on the cross field of urban regeneration and the provision of emergency relief that can stimulate community development. Therefore, I carried out an in-depth study into the phenomenon of bottom-up initiatives in informal tented camps. Commonly, emergency aid is given in these camps, in the form of an emergency building for community purposes that is later taken away. The main reason is that the tent camps are not supposed to become permanent and because donor money is often allocated for emergency relief only. However, in such a devastated built environment, it is crucial to enable the long-term use of buildings through hazard-resistant structures and multifunctional design. Therefore, emergency aid should be combined with rebuilding activities, an approach which increasingly has the interest of humanitarian organisations because of *diminishing economic resources* and *increasingly critical donors*.

Catalysing informal city development

I developed a rapid deployable structure that transforms from an emergency health post to a community centre with a school, market, and area to shelter women. The structure was meant to catalyse the development of the surrounding tent camps by offering facilities that corresponded to the phases of recovery. The project is an example of a way in which a community building can stimulate the *transformation* of the tent camps into a full-fledged part of the city.

My graduation project, supported by the Eindhoven University of Technology, defined boundary conditions for a community building in a tent camp in Port-au-Prince, which stimulated the *transition from emergency aid to rebuilding activities* and supported the changing demands for the development of the community. The whole structure was designed to withstand earthquakes, hurricanes, and floods. The transition was enabled by a demountable, flexible, and locally upgradable structure with fast and easy connections between columns and beams suitable to make a variety of assemblies. A relatively small emergency health post was transformed into a school around a patio, to educate the young



Temporary tent camps transform into low-quality informal settlements when assistance is lacking (illustration: Eefje Hendriks)

population, over 50 per cent of which were under twenty years old. The patio enabled sufficient ventilation, and spaces were covered from direct sunlight to create comfort in the tropical savannah climate. To empower the women, an open market area fully controlled by women stimulated economic development. Next to that, women in danger of sexual harassment or violence were sheltered in the most private and safe part of the community building. Degrees of ownership are created with in-between zones separating and linking the protected space from the more public domain.

You don't know anything

Although from an architectural perspective the community building might have been well designed with strong arguments related to the spatial boundary conditions, the project was far from realistic. Land tenure was a big legal limitation in the transformation of tent camps into neighbourhoods. An alternative approach needs to coincide with governmental and humanitarian policies to get it accepted. To enable such transformation, time-consuming and intensive negotiation would be needed with governmental and humanitarian agencies and inhabitants. Therefore, the architect has to understand those policies and investigate procedures to introduce innovations.

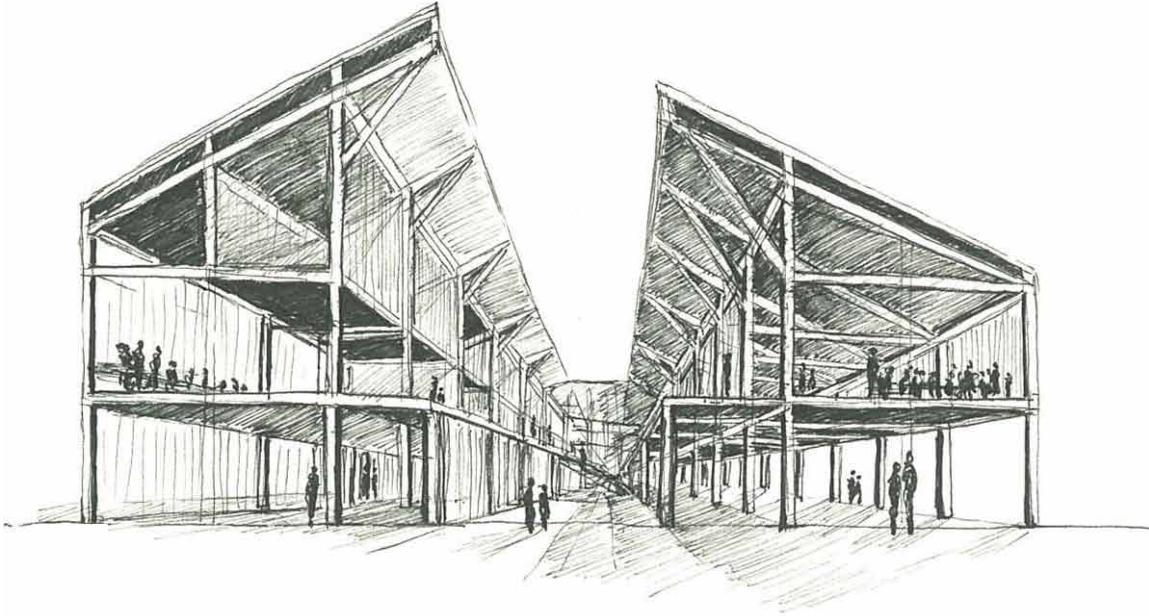
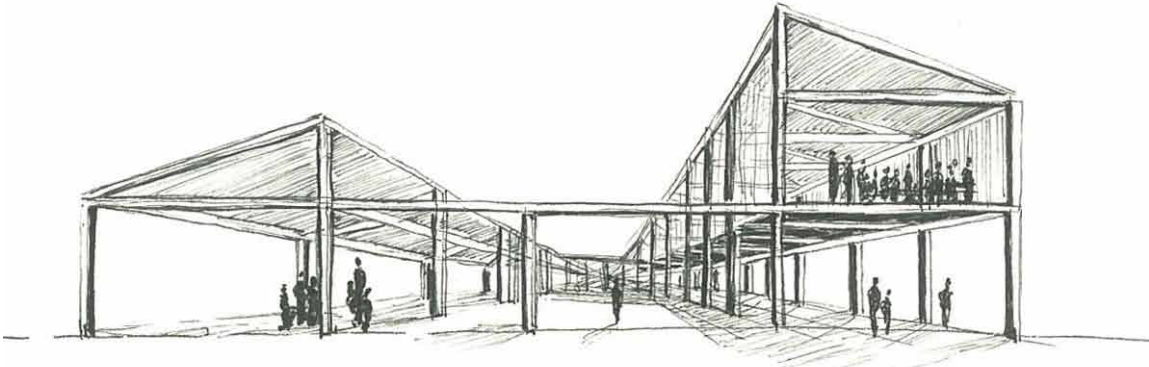
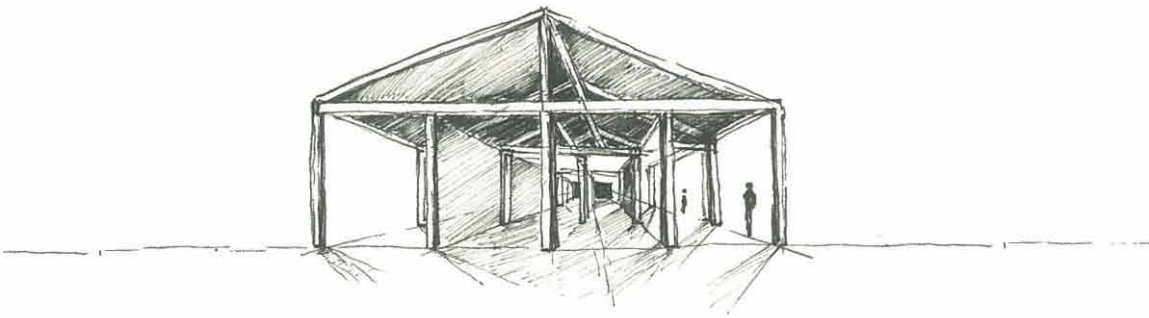
Because of the rather controversial character of my proposal in 2012, I interviewed a number of practitioners from different NGOs and Haitians in the Netherlands to confirm and improve the concept and final design. A Haitian lady, also present at my master's degree defence, highlighted that according to voodoo beliefs, this building would not be accepted by the people because evil spirits could enter through the opening in the patio. This project taught me that there are aspects that we are not even aware of, so we don't consider them. A social anthropologist, one of my experts provided me with a distinct view on the social tensions in the tent camps. I am convinced that this *perspective* was not better or worse than others but just that we all have a piece of information and do not always see the whole picture. The limitations of architecture practice can only be overcome by working together with other disciplines with different perspectives and experiences.

Communicating guidelines for hazard resistance

On the isolated east coast of Nicaragua, in the city of Puerto Cabezas, the practical limitation of constructing a hazard-resistant school became apparent to me after my studies. In a situation where people had barely enough money to feed their family or buy shoes so that the children would be allowed to attend classes, we constructed a well-designed, durable, and hazard-resistant concrete school together with the community. Although people were pleased with the final result, they still had limited knowledge about how to secure their own wooden house from hurricanes despite their eagerness to learn – above all, because the used materials for the school were far too expensive for their own housing. We mainly *shared knowledge and skills* on how to construct a decent concrete structure in which their children could go to school. Some reached a level to become professional construction workers probably able to find a job in construction after our project. However, for most of them, the knowledge we shared was too complicated for them to grasp its value and apply it independently. Although they were not used to communicating on paper and were often not able to read, write, or count, we communicated knowledge through booklets in step-by-step 3D abstraction. There was definitely an opportunity to enlarge the effectiveness of our knowledge exchange so that the local volunteers could apply it in their personal situation.

Are you sure?

Having most of my peers working passionately as architects, I struggled to let go of the opportunity to become what I was educated for. I had to be sure of what I was letting go and chose to work again for an architecture office directly after working in Nicaragua. The incredibly talented group of young architects from all over the world was inspiring to work with, and most of them became good friends. However,



Conceptual drawing of the transformation of an emergency health post to a community centre, which catalyses community development (illustration: Eefje Hendriks)

designing a luxury spa resort in the mountains of Switzerland made me realise I missed the contribution to the lives of those who need it most. It reminded me of people in informal settlements in Buenos Aires and those in Nicaragua that I might be able to assist with my knowledge.

Improved emergency shelter

Through the Eindhoven University of Technology, I continued developing improved shelter solutions together with different humanitarian organisations. I had learnt that to make a difference in the humanitarian sector, one has to fully understand its complex organisation with its practices and all its current limitations. Most emergency shelters are deployed around the world without adapting them to local climate conditions. At the university, we developed a large rapid deployable context-sensitive multipurpose shelter. It could be customised to the function, size, and height needed but especially to extreme climate conditions such as extreme wind loads, snow loads, and sun radiation. With an exceptional guaranteed lifetime of at least ten years, this innovative shelter provided a bridge between emergency and permanent use. After testing the assembly of the shelter numerous times in the Netherlands, Belgium, and even in Senegal, we made improvements to ensure an instinctive assembly method with simple connections.

The field test in Senegal left a deep impression on me. With floods returning every year on the riverbanks in the north that forced people to rebuild their houses and long dry months that made farmers travel long distances to feed their cattle, the impact of climate change was visible in Senegal. This made the place hostile for future perspectives. Many travelled west to find a better life in Cape Verde on a dangerous boat trip. The place gave ambiguous thoughts about supporting people in their dangerous journey or supporting others to stay in such a hostile climate. With our shelter we intended to help both. Although you can find convincing arguments for any kind of assistance, in the end the people decide what conditions are acceptable to them. Therefore, I strongly perceived the necessity to both shelter climate refugees in less hostile climates and invest in measures to prevent climate change worsening.

I also experienced a dilemma during our field research. I am convinced field tests are necessary to verify the quality of a new product, as with all product development. It requires investment in research to make a suitable product. Because research funding is lacking in humanitarian assistance, there is a lack of profoundly tested emergency shelters optimised for different situations. In a lot of emergency or conflict situations, local construction methods take too long or are can be too permanent for host countries or temporary sites. Probably, there will always remain a need for temporary emergency sheltering. However, the involved costs of high quality shelter design feel hard to endorse when compared with the construction cost of local housing. Nevertheless, the contribution to improved emergency shelter could somewhat justify the costs made.

The collaboration with different humanitarian organisations also made me aware of the struggles to get innovative solutions accepted. Although we worked closely together with some of the organisations in the product’s development, it was difficult and complex to get the shelter types accepted in catalogues from which field officers would be able to order. It is mainly hard to find a competing price for new designs. Those humanitarian organisations with a long history have many protocols for surely valid reasons. Nevertheless, grassroots organisations or less centrally organised NGOs with more flexible funding appear to have more opportunities to experiment and innovate.



Constructing a hazard-resistant school in Puerto Cabezas (photo: Eefje Hendriks)

Recognition of self-recovery

In my current doctoral research, I am considering the role of self-recovery after a natural disaster. Natural hazards are increasingly affecting populations. Contrary to what might be expected, less than 15 per cent of the affected population worldwide are sheltered by humanitarian organisations in planned and managed areas (Parrack/Flinn/Passey 2014). This leaves the vast majority, the remaining 85 per cent, to improvise their own shelter (Saunders 2016; Parrack et al. 2014). Last year’s estimates present that the humanitarian sector is only able to cover a quarter of the shelter demand (Development Initiatives 2015). This raises questions about current humanitarian practice. Principally, would it be possible to assist the majority with alternative approaches?

Expert interviews for my PhD research showed that the role of self-recovery is rarely integrated in recovery strategies by humanitarian practitioners in the Netherlands. Many of the affected people have no other choice than that of self-recovery. There is actually very little documented about those that are left without assistance. However, most NGOs do consider the impact of their assistance on the long-term self-reliance of the affected people. Some experiment with methods that serve disaster survivors with minimal predefined solutions – for example, through cash transfer – to protect their authority in decision making. These NGOs want to learn more about the group of disaster survivors that self-recover.

Unfortunately, humanitarian organisations have a strong dependency on donor money, often allocated to a specific quantity of shelter units for a specific price and quality. Donors should be open to consider the impact of supporting a larger group in constructing “safer” units instead of supporting

a minority in constructing certified, often temporary shelters. To convince donors of alternative strategies, *evidence-based research* and *proven examples of better practice* are needed. It is necessary to investigate the needs in self-recovery processes and analyse the awareness of guidelines to build back better and improve the safety of their current structures. This research would enable us to reflect on the way we give aid. How can we support low-income and basically educated disaster survivors in constructing their own hazard-resistant home themselves?

Knowledge exchange as the key to resilience

In the Philippines, I found out that to support the adoption of hazard-resistant construction principles, effective communication by those that have the information with local carpenters and households is often lacking. Local carpenters and households are mostly not aware of how to construct typhoon-resistant shelters and where to find this information. If they find it, there are not always able to understand the documentation provided because some of them are not able to read or write. This is in line with prior research that has indicated that most of the available knowledge-based interventions to communicate hazard-resistant construction principles would not have a lasting effect on community resilience (Spiekermann/Kienberger/Norton 2015). Often, interventions are insufficiently adapted to local conditions, each with their own communication habits and construction skills. Currently available interventions tend to transfer knowledge one-way instead of exchanging knowledge reciprocally between the humanitarian actors and the local community. This hinders the local adoption of new knowledge. Knowledge exchange, as opposed to one-way transfer, is a two-way negotiable sequence of knowledge transfers between actors and leads to a better consensus of ideas and therefore a stronger adoption of knowledge within communities. In the Philippines, I found that those who understand how to build typhoon-resistant shelters lack the financial means to apply it and need more affordable alternatives, which can only be developed in a two-way conversation with experts. Therefore, in my research, I consider knowledge exchange as a communication process instead of knowledge transfer.

As highlighted in the beginning, architects need to explore and understand the context they are working in. This was a story of my journey in exploring and understanding the context of informal settlements in relation to natural disasters. I have noticed that it is not new architecture designs that are most needed in post-disaster situations, nor is it the development of technical knowledge. Rather, it is better ways of communicating this knowledge. I believe that effective two-way communication is key for enabling locals to help themselves and each other.

Development Initiatives (2015): *Global Humanitarian Assistance Report 2015*. URL: http://www.globalhumanitarianassistance.org/wp-content/uploads/2015/06/GHA-Report-2015_-Interactive_Online.pdf (accessed 24 May 2016).
John N. Habraken (2003): *The Uses of Levels*. *Open House International*. URL: http://www.habraken.com/html/downloads/the_uses_of_levels.pdf (accessed 29 January 2016).
Henri Lefebvre/Eleonore Kofman/Elizabeth Lebas (1996): *Writings on Cities*. URL: <http://doc1.lbf.li/aao/FLMF015115.pdf> (accessed 27 July 2017).
Charles Parrack/Bill Flinn/Megan Passey (2014): *Getting the Message Across for Safer Self-Recovery in Post-Disaster Shelter*. *Open House International*. URL: <https://radar.brookes.ac.uk/radar/items/b0bd437a-4aec-4849-a849-fb3f8fc2f0ce/1/parrack2014message.pdf> (accessed 20 December 2016).

Graham Saunders (2016): *Need for Innovation in Sheltering*. URL: <https://issuu.com/shelterresearchunit> (accessed 1 June 2017).
Raphael Spiekermann/Stefan Kienberger/John Norton (2015): “The Disaster-Knowledge Matrix. Reframing and Evaluating the Knowledge Challenges in Disaster Risk Reduction”, in: *International Journal of Disaster Risk Reduction*, 13, pp. 96–108. URL: <http://www.sciencedirect.com/science/article/pii/S2212420915300091> (accessed 21 July 2016).