

CRITICAL & HISTORICAL STUDIES

**An Examination of Resilience  
around the World, and the Power of  
Design and Innovation**

**John Bertolaso**

Royal College of Art  
Global Innovation Design  
Supervisor – Dr Harriet McKay

Friday, 2 October 2015

10,013 words



# Content

<b>Acknowledgements</b> .....	<b>ii</b>
<b>Abstract</b> .....	<b>ii</b>
<b>1. Introduction</b> .....	<b>1</b>
A. Why Resilience? .....	1
B. Methodology & Outline .....	2
<b>2. Chapter 1 - Resilience</b> .....	<b>3</b>
A. Resilience, a Powerful Concept .....	3
B. Urban Resilience.....	4
C. Building Resilience .....	5
D. In Essence .....	5
<b>3. Chapter 2 – Barriers to Resilience</b> .....	<b>6</b>
A. The Difficulties of Learning from the Past.....	6
B. Case Study 1 - Japan .....	7
C. Case Study 2 - Haiti (part 1) .....	9
D. Change is Needed.....	11
E. In Essence.....	11
<b>4. Chapter 3 – Design for Resilience</b> .....	<b>13</b>
A. Innovation and Design Thinking.....	13
B. Humanitarian Innovation .....	14
C. In Essence .....	15
<b>5. Chapter 4 – Emergence of Resilience</b> .....	<b>16</b>
A. Case Study 2 - Haiti (part 2).....	16
B. Case Study 3 - Uganda .....	18
C. Other Examples of Resilience Around the World .....	20
D. Facilitating Resilience .....	22
E. In Essence.....	23
<b>6. Conclusions</b> .....	<b>24</b>
A. Lessons from Around the World .....	24
B. Facilitating Resilience .....	24
C. The Future of Resilience.....	25
<b>7. References</b> .....	<b>26</b>

# Acknowledgements

This dissertation would not have been possible without a few special people. I would like to thank Dr Harriet McKay for her lasting support, her enthusiasm, her availability, and her valuable guidance. I would also like to thank my parents, who inspire me and who continuously open my eyes about the world. And a special thank you to Edward Brial for being there, and for discovering the world with me.

## Abstract

Today, urban environments are growing and both natural and man-made disruptions are becoming increasingly complex, leaving the world's both poorest and richest nations exposed. Such threats to our socioeconomic, political and ecological systems highlight the importance and relevance of the concept of resilience in this time of change.

In this survey, the case study of Haiti following its 2010 earthquake and Japan following its 2011 triple disasters were analysed in an attempt to gain a better understanding of why both the wealthiest and the poorest nations show vulnerabilities in the face of disruption. It became clear that there is a need for governments and organisations to adopt new methods to tackle today's challenges, and the role of design and innovation was explored. Along with a continuation of the case study of Haiti, the case study of Uganda and its refugees was analysed to try to understand what can enable certain resilient mechanisms to emerge, even in the most critical situations.

Resilience was found to manifest itself through a complex combination of factors relating to infrastructures, services, and local economies. The importance was also asserted of adopting collaborative and multi-disciplinary approaches to enable local communities to help themselves and to gain financial independence. In showing that resilience is becoming an increasingly potent driver for innovation and progress, I have been able, through this study, to clarify my purpose as an engineer and a designer and to gain confidence in how I can contribute to making this world a fairer place.

# 1. Introduction

## A. Why Resilience?

I was introduced to the topic of resilience about a year ago, when I attended a talk by Andrew Zoll, author of the book *Resilience: Why things bounce back*. I quickly realised how relevant resilience is today, and how powerful a concept it is.

We are living in a fantastic time of change where centuries of relentless progress have brought us unprecedented access to knowledge, services and connectedness. Developing nations have seen tremendous progress, with growing efforts to fight poverty, improve access to food, clean water, sanitation, etc. Often protected from disruptions, most of the developed world has grown to be robust and efficient. However, as shocks and disruptions are growing more complex and more catastrophic, we are entering an era where political, financial, socioeconomic and ecological systems are becoming increasingly vulnerable (CRED 2009). In the past century, we have seen catastrophic events disrupt both the developing and the developed world like never before. Earthquakes and tsunamis have killed hundreds of thousands of people in South Asia, and hurricanes in the USA have destroyed close to a million homes, rendering entire regions inhabitable.

Considering these alarming trends in terms of the frequency of disasters and number of people affected in the world's both richest and poorest nations, I wonder how prepared we are to face and recover from natural hazard, socio-economic, political and cultural crises, and also technology-related threats such as oil spills, chemical contaminations, telecommunication disruptions or internet breakdown.

This survey is an opportunity for me to try to understand why most of us, living in developed nations, have often been spared from chaotic disruptions, while the poorest nations suffer the most; but also why sometimes even the most advanced nations seem to collapse under the unpredicted repercussions of shocks. I feel there must be much to learn from the ways in which developing countries have adapted to bounced back. With an engineering background and now studying in the field of innovation design, I am also trying to define my role in this world, and find how I can contribute to making it a fairer and more resilient place.

## B. Methodology & Outline

I started the investigation looking mainly at news articles and official reports from major organisations such as the World Bank and the United Nations. Zolli's book on resilience also provided important information regarding the concept and its relevance. Although I recognise the power of visual illustrations, I have not found the need for any in this context.

In order to answer some of those questions, I will begin the dissertation with an exploration of the concept of resilience, what it means, and why it is particularly relevant in an urban context. In the second chapter, I will look at two specific case studies at opposite ends of the economic spectrum. Japan following its triple disaster in 2011 and Haiti following the 2010 earthquake both showed a lack of resilience facing disruption, and I will attempt to clarify the reasons for the shortcoming observed and what should be done better. Considering the need for governments and development/humanitarian organisations to change their attitudes towards resilience, the third chapter will look at how *design thinking* principles can be used to develop more suitable solutions. Finally, two further case studies of instances where resilience successfully emerged will be investigated in the fourth chapter. Despite significant shortcomings following the 2010 earthquake, Haiti also gave birth to resilient mechanisms and this case study will be continued. The concept of resilience is not only relevant to natural disruptions. Today, we are facing a serious refugee crisis forcing millions of people worldwide to live in precarious conditions. The final case study will look at refugees in Uganda and the ways in which they have adapted to create opportunities for themselves in order to improve their living conditions. With the help of a few additional examples, this fourth and final chapter will attempt to understand what is necessary for resilience to emerge.

## 2. Chapter 1 - Resilience

### A. Resilience, a Powerful Concept

Natural adverse events often have disastrous repercussions, disrupting entire areas and their populations. However, death, destruction of homes and infrastructure, and ecological, cultural and economic damage should not be the inevitable consequence of such events. Adaptation to and anticipation of one's environment is key to lowering the risk of disasters and crises. (Alliance Development Works 2013) This leads to the introduction of the concept of resilience. Resilience is about the ability of a nation, a community or an organisation to overcome disruption, to 'bounce back'.

Over the past 10 years, and particularly following the 2008 food, fuel and financial crises, the buzzword 'resilience' has become synonymous with hope (Hussain 2013). Today, it is widely used in international development contexts, and everyone is claiming to be building resilience. However, definitions vary, often causing confusion. In addition, resilience is difficult to measure as an output, given the fact that measuring the response to an event that has not happened (and that might never happen) is a complex task. A first step in understanding this emerging field is to provide a clear definition of the concept.

Although resilience does not have a single definition, the UNISDR (United Nations Office for Disaster Risk Reduction) offers a succinct one. It suggests that resilience is "the capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure." (UNISDR 2004) The concept of resilience comprises different layers affecting international, national and local communities, as well as individuals. These can be grouped as economic, natural (water, land and forest), physical (infrastructure), human (education and health) and social (politics and institutions). (Groupe URD 2013) Each can provide the tools necessary for a community or system to bounce back.

The World Risk Index was developed by the UN as a way to assess the disaster risk of a country based on environmental factors, but also societal and economic ones. Its aim is to evaluate a country's vulnerability and resilience. The 4 components of the index are: **exposure** to natural hazards; **susceptibility** depending on infrastructure, housing conditions, and economic framework conditions; **coping capacities** determined by governance, preparedness and healthcare; **adaptive capacities** relating to future natural events and climate change. These components provide a useful guide for the measurement of resilience. However, as Robert Blasiak from the United Nations University points out, "just as courage may only become apparent in dangerous

situations, perhaps a system's resilience cannot be observed until it faces some external stress." (Blasiak and others 2012)

## **B. Urban Resilience**

Considering the speed at which urban environments expand, as well as the vulnerability of such complex systems, building more resilient cities appears to be a particularly vital task.

Today, half of the world's population is living in cities and urban growth patterns are observed worldwide. Urban growth can be seen as a positive phenomenon as high correlations have been found between urbanisation and reduction in poverty. (The World Bank: Urban Development and Resilience Unit 2014) "Urbanisation has become a positive force for transformation that makes countries more advanced, developed and richer, in most cases"(UN Habitat 2012: x) However, with over 3.3 billion people in developing countries, a major expansion of urban environments also creates important challenges. Owing a growing dependence on networks, supply chains, communication systems, inter alia, people and assets are becoming more vulnerable. Natural and manmade disruptions to these complex systems can have catastrophic impacts on a city's ability to meet the most basic needs of its citizens and reverse decades of economic development gains. (Benson and Clay 2004) The increasing range of shocks and stresses associated with rapid urban development therefore creates the need for more resilient cities.

Cities are complex systems which depend on the operation of their subsystems as well as on the larger structures in which they are held. A city's resilience is therefore affected by the resilience of those smaller and larger systems. It is characterised by robustness, redundancy, diversity, coordination, reflectiveness, and inclusiveness (The World Bank: Urban Development and Resilience Unit 2014). Urban systems include land (formal and informal tenure), housing (owner/tenant, building industry, etc.), services (water sanitation, fuel, etc.), local economy, community, and urban planning. (Groupe URD 2013)

However, a common misconception is to see resilience in systems that are actually robust-yet-fragile. Robust-Yet-Fragile is a term used to describe "complex systems that are resilient in the face of anticipated danger but highly susceptible to unanticipated threats." (Zolli and Healy 2012: 27) These are strengthened with compensatory systems that often become their source of fragilities. Isolated from the unexpected, most cities in the world's richest nations have grown to be robust-yet-fragile, as will be seen in this survey.

## C. Building Resilience

“Resilient city development is a dynamic process focused on strengthening the ability of the urban system to change, adapt, absorb, and learn from acute shock or chronic stress along its path towards sustainable development.” (The World Bank: Urban Development and Resilience Unit 2014: ii) Resilient development requires multidisciplinary/multisectoral approaches, and a better understanding, better measure and better prediction of hazard. According to Zolli (2012), there are various ways to increase resilience. Three fundamental principles are **dynamic reorganisation** to ensure that operations are maintained to serve the original purpose, and **de-intensification/decoupling** of systems from their resource requirements, and **localising** operations to ensure flexibility. In order to provide such modularity, resilient systems need to be diverse and responsive at their edges, while having a strong, stable core. These principles will become clearer throughout the survey.

## D. In Essence

Disruptive events only become disasters when we are not prepared for them. Building coping mechanisms to bounce back from the unexpected is vital.

Urban environments are growing exponentially, and growing in complexity. In such environments, the repercussions of increasingly more frequent shocks and disruptions are amplified. Around the world, and particularly in the least developed countries climate and disaster resilience should become a priority for governments and the development sector.

Multidisciplinary approaches are essential for overcoming the vulnerabilities of systems, communities, countries and environments.

### 3. Chapter 2 – Barriers to Resilience

As the repercussions of disrupting events become increasingly complex to tackle, we are often reminded that the developing world struggles to fight and recover, and that despite having stronger economies, developed nations are not prepared for extreme disruptions either. In this chapter, I will attempt to understand what is the cause of such vulnerabilities.

#### A. The Difficulties of Learning from the Past

Over the past decade, it has become apparent that nations around the world often fail to gain a holistic understanding of complex emergency situations, and seem to lack the creativity needed to foresee the possible repercussions of action (and inaction). As a result, both internal and international interventions are often unsuitable for long-term progress. This is partly due to complicated international relations, which are often based on a spirit of competition and personal gain rather than collaboration and compassion. Governments and political actors have their hands tied by the prospect of popularity gain and potential re-elections. International organisations are at the mercy of external funding or complex political engagements, often constraining or biasing the scope for action. Such incapacity to act effectively has manifested itself in several ways.

One striking example is Haiti, which 5 years after being hit by an earthquake is still fighting to recover. Referring to the organisation of the response following the earthquake, Dr Mirta Roses Periago of the United Nations explains: “It followed the same chaotic pattern as past disasters. Information was scarce, decisions were not evidence-based, and overall sectoral coordination presented serious shortcomings. Management gaps noted in past crises were repeated and amplified in Haiti. The humanitarian community failed to put into practice the lessons learned”. (McClean 2012) The case of Haiti will be explored in further depth later on in this survey.

More recently, the migrant crisis facing Europe has also highlighted the shortcomings in the response of the international community. Since the beginning of 2015, over 350,000 people have crossed the Mediterranean Sea to reach Europe and at least 3000 have died on the way (Le Monde 2015). Most are refugees escaping from war and persecutions in Syria, Iraq, and Eritrea, but mass displacements are happening in many other places around the world. After months of inaction, European governments are finally taking measures to face the hundreds of thousands of asylum seekers. Looking back at the origins of those conflicts and wars, many questions arise regarding the responsibility for conflicts in some of those countries, or regarding the thresholds that need to be overcome for the international response to take place.

Evidently, the nature of such situations is extremely complex and the relationships between the different parties involved are entangled. What seems clear is that the way that the international community responds to situations like these suggests a predisposition to obliviousness to the past. In this chapter, two cases will be explored to provide a better understanding of different situations of crisis, and how a general lack of resilience was observed in the ways in which these situations were dealt with.

## **B. Case Study 1 - Japan**

Japan is a good example of a wealthy nation that has recently suffered from a large-scale catastrophe. It is the third largest economy in the world, but is also ranked 15th on the list of countries that are most at risk worldwide (using the World Risk Index (Alliance Development Works 2013)). This makes Japan the country with the highest natural disaster risk in the developed world.

Japan has a history of transformation. This has become even more apparent in its modern history, when in the late 19th century it shifted from a state of isolation to a complete acceptance of the Western way of life, and when, following WWII, it rose from its ruins to become a major global economic player.

### **B.1. A TRIPLE DISASTER**

On 11 March 2011, an earthquake of magnitude 9 hit Japan and triggered a powerful tsunami. Three prefectures were devastated simultaneously. These natural disruptions caused in turn a nuclear meltdown at the Fukushima nuclear power plant. The triple disaster is responsible for close to 20,000 casualties, and it has led to the displacement of over 300,000 people. In addition, radioactive leaks contaminated an entire ecosystem and still pose a threat to residents in the Fukushima area (Greenpeace 2015). The total economic costs are estimated at US\$235 billion, making this catastrophe one of the most costly in history (Kim 2011). Due to its location near major tectonic plate boundaries, Japan is particularly exposed to earthquakes. Until 2011, it had suffered from two major earthquakes in its modern history. The 1923 earthquake resulted in fires ravaging the Kanto region, devastated Tokyo and killed over 100,000 people. The 1995 Kobe earthquake led to severe infrastructural damage and close to 300,000 people were displaced.

### **B.2. AN OUTDATED RESPONSE**

In 1995, the disaster response that took place in Kobe was led according to a scheme written in the early 1960s, and this resulted in uncoordinated relief operations and slow individual and communal recovery. Since Kobe, Japan has experienced multiple lower scale earthquakes and the government has begun to invest more resources in disaster prevention and recovery. Despite recent efforts, the 2011 plans for long-term intervention were still based on an outdated scheme of national government subsidies which are not suitable in Japan's current society. Considering the scale of the

catastrophe, the lack of coordination amongst prefectures and the complex repartition of responsibilities (for the natural and nuclear accidents), it became evident in 2011 that Japan was not prepared to face the March 11 events. Today, scientists are predicting new large-scale earthquakes in the coming years and the tools that have been used by Japan to face such events are now coming to an expiration date. (Maki 2013)

### **B.3. TODAY AND TOMORROW**

Since 2011, preventive measures are being taken in various sectors in an effort to increase Japan's capacity to face earthquakes. New buildings are subject to strict regulations to satisfy safety requirements and existing ones are undergoing retrofitting work. Schools around Tokyo are now equipped with seismographs to collect and transmit data to local municipalities. Emphasis is also put on educating locals (particularly children) about disaster risk management. Strategic information sharing and education were proved to have been particularly effective in saving lives in 2011. For example, in certain communities, children were taught in class where to find shelters on higher grounds (Friends of Europe 2013).

However, many possible complications still need to be tackled, such as risks of fires, disrupted power supplies, or even the eruption of Mount Fuji. Japanese seismologist Katsuhiko Ishibashi suggests that both short term and long term plans are necessary to make Japan less vulnerable. As part of those plans, individuals as well as collectives and companies need to take action independently and fight the traditional *okami makase* (blind reliance on the ruler or government). The idea of decentralisation is a crucial step in the process of strengthening the country; building a resilient nation requires its politics, businesses and other parts of its structure to gain independence from Tokyo. One of the biggest challenges will be to change the public perception of the situation and promote such a movement away from the capital, as a strong sense of fatalism is deeply rooted in Japanese culture (the *shouganai* mindset is about accepting one's fate). (Birmingham 2013)

### **B.4. LEARNING FROM STRENGTHS AND WEAKNESSES**

Based on the strengths and shortcomings of Japan's response, both the limitations of predictability and the importance of establishing strong communities should be remembered.

Disasters are not always predictable and excessive reliance on infrastructures built to resist tsunamis or earthquakes and on incomplete scientific knowledge has been shown to be particularly dangerous. It is the very flaw of robust-yet fragile systems. Walls were built around the coast, but they proved to be inadequate and resulted in thousands of deaths.

In the days and weeks that followed the 3-11 events, communities in the Tohoku region showed a remarkable sense of community resilience. The local populations quickly

organised themselves to make themselves useful, with volunteers intervening the affected towns and farmers providing food. These bonds can be partly explained by the small scale of those towns along with a culturally homogeneous population. It is also suggested that the strong sense of community is due to the harmonious ties existing between the locals and nature, inspired by Shinto and Buddhist beliefs. The sense of community observed is what saved many lives (in areas like the Urato Islands) and is precisely what is currently driving recovery efforts in the area (Blasiak and others 2012). Besides, considering the speed at which urbanisation is taking place, accurate impact predictions are getting increasingly difficult. Disastrous events can cascade in unforeseeable ways, so while predictions are part of the answer, building resilience is crucial to provide the tools to recover from any situation. (Usher 2013)

“Resilient societies are built out of people as well as concrete” (Usher 2013), when the concrete is gone, the people will remain, and the people will build again. Social cohesion and community resilience can provide the strong ties necessary for a nation to bounce back. Considering the difficulty of knowing what data and indicators should be used to measure resilience, perhaps a priority for governments should be to work on strengthening community bonds. After all, resilience is also about the interconnections between people and the level of trust instilled amongst them.

Overall, 2011 can be seen as a tragedy. However, shortcomings can also teach valuable lessons, and the way that Japan has rebuilt itself as a more resilient country can serve as an example in the development sector.

## **C. Case Study 2 - Haiti (part 1)**

At the other end of the economic spectrum, the second case explored is Haiti. With a GDP ranked 140th, Haiti is the poorest country in the northern hemisphere and one of the poorest nations worldwide. Its World Risk Index is ranked 21st due to its high vulnerability and lack of coping capacity in the face of disrupting events. (Alliance Development Works 2013)

### **C.1. A DEVASTATING EARTHQUAKE**

Haiti's World Risk Index was gravely illustrated in 2010, when it was hit with a magnitude 7 earthquake, as well as in the events that followed.

The majority of Haiti's population lives in informal housing, which is concentrated in only 20% of its urban territory. The impact of an earthquake of that magnitude is particularly pronounced in areas where the conditions of living are so precarious. As a result, the disaster affected over 3 million people, killed over 200,000 people and led to a cholera outbreak (Groupe URD 2013) (Clermont and others 2011). Five years later, the country is still in a state of turmoil, struggling to recover with the help of international organisations. Haiti is now fighting extreme poverty, high rates of unemployment, inadequate infrastructures and access to services, and high rates of malnutrition.

Despite sharing similar exposure to natural threats, Haiti has seen a much slower recovery than Japan. This can be partly explained by the difficulties faced by international organisations due to its economic instability. As Sálvano Briceño, Director of the UN International Strategy for Disaster Reduction, suggests, “It’s poverty that is at the core of these disasters” (Clermont and others 2011: i).

### **C.2. AN ISOLATED INTERNATIONAL RESPONSE**

Following the earthquake of 2010, the international community’s immediate response focused heavily on building transitional shelters, committing to provide repair support in a secondary phase. When a natural disaster occurs, housing is the sector that suffers the most and restoring the function of the housing sector is therefore a priority. A significant problem was that local populations transformed the transitional shelters provided into permanent housing, and the lack of foundations and reinforcement led to an increased vulnerability of housing stock. (Groupe URD 2013)

At the same time, the local communities focused on interventions to build shelters and repair houses. Construction represents an important fraction of the local economy, and the efforts conducted by the local communities resulted in the creation of the largest number of shelters. Despite those efforts, the international community spent half a billion dollars on transitional shelter, and very little was invested in support for locals, repairs or reconstruction. The majority of the money invested on shelters was spent outside the country, therefore not pushing the local economy to regain momentum and not helping the creation of jobs. Locals had no choice but to accept whatever help was available. This lack of control over the situation affected the people’s feeling of dignity, which is core to consolidating individual resilience.

Following the earthquake, the locals were left with two possibilities, either live in camps, or move back to their communities. Given the perceived complexity of adopting a community-based strategy to assist people in returning to their homes, the international community chose focus on supporting access to camps. Community leaders as well as local authorities were left powerless, with no opportunity to participate in the management of the response. Understanding urban context in which a response is required is essential to contributing to collective resilience, and it cannot be achieved without considering local guidance.

### **C.3. LEARNING FROM THE PEOPLE**

In complex contexts like Haiti’s urban environment, a holistic understanding of the situation is essential to strengthen the people, communities and infrastructures. A big challenge in urban resilience is that rather than replacing assets following a disaster, the entire construction culture should be changed. Following cholera outbreak, huge efforts to promote prevention and changes in hygiene habits were undertaken, whereas following the earthquake, no measures were taken to promote safer construction practices.

It was found from surveys that the main priority of Haitians was to find work and gain financial independence to support themselves and their loved ones. “Access to livelihood opportunities and jobs is an essential dimension of resilience; as such, another opportunity to reinforce individual resilience was missed.” (Groupe URD 2013: 5) Individual resilience is a key factor to restoring an adequate state of functioning within an affected area. Community-based approaches are also essential to face urban challenges such as access to basic services. “Building collective urban resilience is not just having a city physically more resilient to the next earthquake, but also having communities less prone to socio-economic and political risks.” (Groupe URD 2013: 6)

## **D. Change is Needed**

Around the world, programmes aimed to provide assistance in particular situations of crisis have been reused or cross-purposed, often planned remotely without necessarily being adequate. The problem with international help is not “the lack of money but lack of focus, lack of coordination, and an inability to learn lessons from the past.” (Applebaum 2015) In addition, Chio Morgan, founder of the Africa Water Bank, comments “the premise that resilience building can be driven by external agencies is flawed - most successful development and resilience building needs to primarily come from within, not outside”. Morgan argues that any agency should start by asking the intended beneficiaries of its support how it can contribute to their well being, as well as understanding how the affected community will participate. In order to empower affected communities, it is necessary to redefine the dynamics between external and local contribution. (Hussain 2013)

It must be said that media have a strong responsibility in communicating to the world the entire story of a disaster, including the “less sensational after-effects of disaster risk management campaigns”, and in showing the importance of more resilient communities. (Friends of Europe 2013: 5)

## **E. In Essence**

Developing nations are often the most exposed to natural threats and other disruptions, because poverty and economic instability are the roots of a country’s vulnerabilities. Despite their economic advantage, wealthier nations are not exempt from disruptions and their destructive consequences, as seen in 2011 in Japan. In order to prepare for such events, and become more resilient, conventional industrial-era thinking needs to be challenged, and new plans must be developed. Reducing a nation’s reliance on predictions and building educated and stronger communities are fundamental step in building shock-absorbing systems.

Understanding the complexity of the local people, communities and dynamics through continuous collaboration between external and local actors is crucial to growing individual and collective resilience. The different parties should work together to create economic opportunities and provide the financial independence of local populations.

## 4. Chapter 3 – Design for Resilience

It has become clear that there is a need to rethink and restructure existing organisations and systems to be more resilient, and to provide more resilience.

The new types of stresses and challenges affecting the humanitarian system have given birth to the concept of Humanitarian Innovation. Humanitarian Innovation is about using innovative ideas and methods to solve problems in a humanitarian context, and those innovative ideas and methods are generally based on or inspired by design thinking principles such as human-centred research and iterative prototyping. Before exploring the topic of Humanitarian Innovation in further depth, a few key concepts are to be clarified.

### A. Innovation and Design Thinking

Innovation is about challenging the status quo, it is about thinking outside the box, it is about connecting dots. Innovation is what makes the world move forward, it brings progress and instils change. Globalisation, relentless technological progress, extreme weather conditions are all contributing to the creation of new challenges, and problems such as fighting hunger and poverty, providing education worldwide all require truly innovative approaches relevant to our present and our future. Innovation can sometimes appear organically, without any particular structures or methods. However certain tools can be used as catalysts to foster innovation, and a particularly powerful tool is *design thinking*.

Design thinking is an exploratory process which is used as a set of principles to give birth to relevant solutions. Despite not having a rigid structure or guidelines to follow, innovative outputs can be achieved by following three main steps: inspiration (defining a problem and identifying an opportunity), ideation (finding a potential solution) and implementation (testing, adapting and producing) to be followed iteratively. As part of the process, there is recognition of the fact that understanding people's behaviours through insights, observation and empathy is key to understanding how to address issues in a meaningful way. According to Tim Brown, CEO of design and innovation consulting firm IDEO and one of the precursors of the recent popularisation of design thinking, design is too important to be left to designers. (Brown 2009) Innovation emerges from the direct engagement and collaboration of multidisciplinary teams, bringing expertise and skills, with the consumers and the people in need.

## B. Humanitarian Innovation

Humanitarian and development organisations today show tremendous potential to innovate given their fieldwork experience and the direct engagement they have with the people affected.

The United Nations Office for the Coordination of Humanitarian Affairs published in 2014 a paper discussing the role of innovation in a humanitarian context. Innovation principles are taken from the private sector to invent, generate ideas, use technologies and solve problems in order to increase coping capacities of affected people. Innovation is “a means of adaptation and improvement through finding and scaling solutions to problems, in the form of product, processes or wider business models, [...], it need not [involve] the creation of something absolutely novel, but often takes the form of adapting something to a different context” (Betts and Bloom 2014: 5) In practice, it relies on the three steps described previously, as well as ‘scaling’ as a fourth step. The main driving force for humanitarian innovation is the need for a new business model. Humanitarian assistance in its current form is unsustainable; it undertakes large tasks which are very costly, and with ill-suited tools.

The main challenge when looking at a change in the existing humanitarian system is the **closed market**. There is a general belief that humanitarian goods should be exclusively funded by the inter-governmental sector due to a lack of interest for private actors. As a result, choice and feedback opportunities are lacking. The success of humanitarian interventions is assessed based on the fulfilment of donor requirements rather than on direct feedback, therefore suppressing the drive to innovate. “An alternative model would base the opportunity to supply humanitarian goods not just on regulatory privilege, but on performance and value, opening the system up to non-traditional ideas and suppliers, including the military and the private sector.” (Betts and Bloom 2014: 11) In the creation of such goods, it is essential to consider local skills, talents and aspirations to design in innovative ways through user engagement. There are also issues associated with **ethical constraints** as the involvement of external parties creates the risk of accentuating conflicts, local power dynamics, or cultural sensitivities. Finally, due to the high stakes of humanitarian success for political and multinational bodies, **aversion to risk** is another significant challenge. While the humanitarian sector focuses on the Business as Usual model, private sector can encourage ‘fail fast’ approaches to come up with the most suitable solutions. This illustrates the dilemma of looking at the past to see what has worked, or looking at the future to be part of it.

UNICEF is a good example of a humanitarian and development organisation that has taken initiatives to integrate innovative practices at the core of its activities. It has recently created the UNICEF Innovation Labs which bring together governments, businesses, universities and other parties to work on tackling relevant challenges facing children and youth. These ‘open, collaborative incubation accelerators’ exist in

various countries on all continents and aim to develop creative sustainable solutions to problems associated with nutrition, water and sanitation, education, to mention but a few. Having worked on over 270 projects so far, the UNICEF Innovation labs are expanding to new locations, taking with them their core principles for innovation and technology, which include design with the user, understand existing ecosystems, design for scale, be data driven and do no harm. This example highlights the power of engaging people of varied backgrounds and fields of expertise to facilitate innovation.

Today, we also see a growing number of companies that are providing the framework to support and promote innovation *in* and *for* the developing world. OpenIDEO uses the collective power of the global community sharing backgrounds, talents and ideas to tackle complex global issues in innovative ways. This human-centred collaborative approach spans over 3 to 5 month periods. The projects follow IDEO's design thinking methodology previously outlined. The community can participate in different ways, either by convening, learning, sharing, collaborating, creating, or experimenting. Challenges vary widely, but are always focused on large-scale impact. Some of their challenges so far have focused on equipping and empowering care community to fight Ebola, improving sanitation and human waste management in low-income urban communities, or creating learning opportunities for refugees around the world. OpenIDEO is a compelling example of design thinking in practice, using the power of crowd-based knowledge, skills and expertise to solve complex problems.

## C. In Essence

Alternative innovative methodologies, including *design thinking* principles, are becoming increasingly relevant to tackle today's challenges.

Humanitarian innovation is an emerging field incorporating innovative practices at the centre of the humanitarian activities. In order to promote such practices and drive progress, the private sector needs to be involved in humanitarian interventions. Recognising local skills and aspirations and helping people create opportunities for themselves are also essential for the creation of long-term solutions.

Various companies and organisations are now opening their practices and involving innovative approaches for the developing world. These often highlight the power of engaging multi-disciplinary people to solve problems in novel ways.

## 5. Chapter 4 – Emergence of Resilience

The challenges that we are facing today are becoming increasingly complex, and we have seen that new tools and approaches are now needed to tackle them. This chapter will present two case studies and additional examples showing how resilience can emerge as means to counter disruptions.

### A. Case Study 2 - Haiti (part 2)

Although not the most powerful, the 2010 earthquake in Haiti was the most catastrophic one that the nation had seen and its consequences were of unimaginable scale. The fragile socioeconomic, political and racial systems in place collapsed entirely, and millions of people were affected. From this chaotic situation emerged Mission 4636, which changed the lives of thousands.

#### A.1. MISSION 4636

Thanks to the Internet, the news of the events spread almost instantaneously, bringing awareness to an entire global community. Led by Patrick Meier, an initiative to map social media as a response to the earthquake began. The company Ushahidi was contacted directly in order to use their existing mapping tool for data collection and visualisation. SMS texts, Twitter, and Facebook were all used to identify how each areas of the country had been hit and to coordinate responses accordingly. The effort involved thousands of volunteers collaborating remotely around the world. Considering the scale, complexity, and pressing nature of the project, Meier allowed people to organise themselves organically, letting the effort be 'emergent'.

In parallel, Josh Nesbit (working for Front-lineSMS, now known as MedicMobile) set up channel for locals to share their experiences in real-time. Indeed, only 1% of the population was online at the time whereas up to 80% had access to a cell phone. The importance of securing an SMS channel was evident. Following an open call on Twitter, he managed to secure the SMS code 4636 for Haitians to send distress and information messages.

The technical realisation of the SMS information collection and interpretation was then passed on to InSTEDD, a non-profit organisation dedicated to providing innovative support in emergency situations. They built the message collection infrastructure and then ensured that Ushahidi could access and process those messages. The SMS line was made known to the locals through radio messages. A large quantity of the incoming messages (including local addresses) were in Creole and difficult to use. These were therefore communicated to Creole speakers all around the world to be translated and sent back to Ushahidi.

Finally the mapped data was transmitted to UNDAC (Disaster Assessment and Coordination), which responded by sending search and rescue teams in the field to answer the emergency calls. “Together, the 4636 team, along with thousands of strangers from all over the globe, had built a pioneering digital disaster response system, largely from scratch - without a single organisation or person in charge.” (Zolli and Healy 2012: 184)

Overall, the project failed in multiple ways, owing to communication problems between Mission 4636 and formal institutions, or to its limited scale. However, its innovative and efficient methods to mitigate the detrimental effects of the crisis must be remembered. First, the informal social connections tying the ‘ecosystem of collaboration’ enabled outside volunteers to rapidly become essential to the existing group in a network based on trust. Second, the leading figures led by example, investing unconditional faith in the project, even when facing the most difficult challenges. Third, the operation demonstrated a good understanding of local conditions allowing for a more effective and tailored response.

#### **A.2. NOTE ON USHAHIDI**

Ushahidi was core to the success of Mission 4636, and its story demonstrates the power of design thinking principles. It was born during the Kenyan post election violence in 2007. Ory Okolloh started collecting and geo-tagging every incident of violence on her personal blog (Ushahidi means ‘to bear witness’ in Swahili). Quickly overwhelmed by the amount of information needed to be processed, helped by developers found on the internet, a platform was created to reflect in real-time the progress of the conflict, by also allow locals to contribute anonymously to the reports (using their cell phones). The tool could be used to see what was happening where and understand the progress and evolution of situations.

The innovations associated with this project are numerous. It allows for a more resilient response structure and its modularity allows it to be used in conjunction with other systems (as seen in Mission 4636). It is also adaptable to different contexts; since its creation, it has been used all over the world in situations of violence outbreaks, health epidemics, and ecological disasters.

#### **A.3. NOTE ON BIG DATA**

In the digital world of today, we have access to data more than ever before. Crowd-sourced data, ground sensors, open datasets, geospatial data, mobile usage, and many others are everywhere around us. Once the difficulty to identify patterns and extract useful information is overcome, real-time collection and correlation of data create tremendous opportunities to build resilience (for example in the identification of weather trends and management of food crops, or in the identification of areas of emergency). Although the development sector is still unprepared for it, there is a consensus on the fact that access to data (and big data) holds great potential for innovation. (The World Bank Group 2015)

## B. Case Study 3 - Uganda

Natural disasters are not the only types of disruptions that highlight the need for more resilient mechanisms. According to the UN High Commissioner for Refugees Antonio Guterres, we are currently facing the most serious refugee crisis in 20 years. With mass displacement from Syria, Afghanistan, Iraq, South Sudan, Somalia, amongst others, the total number of refugees worldwide adds up to 15.4 million. Governments and NGOs fail to recognise and understand the ways in which refugee communities operate. Existing approaches and humanitarian response are generally suitable for short-term, but often cause long-term misery. New approaches for assistance are required.

Despite the critical situation of displaced populations, international response is often unavailable for political reasons. As a result, temporary camps become permanent for many years, and socio-economic opportunities are limited. However, in some cases, refugees manage to evolve independently and create those opportunities for themselves.

Being in close proximity to unstable nations, Uganda is currently home to close to 700,000 refugees and asylum-seekers, mainly from the DRC, South Sudan, Eritrea and Somalia. The magnitude of the displacement of populations into Uganda can be explained by the traditional hospitality and generous asylum policies of its government. The measures taken by the government to allow refugees to work and travel make Uganda a relatively positive case to study refugees, and can provide good indication of what the potential for refugees is once granted basic levels of freedom. (UNHCR 2015)

The Refugee Studies Centre along with the University of Oxford have worked together to understand the economic systems of displaced populations and to challenge five popular myths about refugees. The information used in this study was collected in Nakivale and Kyangwali settlements, as well as in Kampala. (Betts and others 2014) The study challenges 5 popular myths about refugees' economic lives: refugees are isolated, a burden, homogenous, technologically illiterate, and dependent on humanitarian assistance. Each of these assumptions was shown to be incorrect.

### B.1. REFUGEES ARE ECONOMIC ACTORS

It was shown that 99% of refugees are economic actors, with 60% self-employed, 39% employed by others, and 1% unemployed. By providing fresh farming products, textiles, jewellery and transport (amongst many), refugees are involved in international trade networks, and are integral parts of national and local value chains. They are economically diverse and often make positive contributions to host state economies, notably by generating employment for Ugandans and other refugees. Internet connections, mobile phones and other technologies are key to their activities, with about 89% of refugees in urban settings and 46% in rural areas being technology users.

Many external interventions have been attempted in the past with the ambition to enhance self-reliance and provide opportunities to refugees. However, such projects often lack of collaboration between governments, humanitarian and development stakeholders, and the solutions brought forward are generally unsuitable.

Without strong collaborative efforts, and a holistic understanding of the situation in which the interventions take place, the potential impact remains limited. Despite their difficult living conditions, many refugees operate independently from humanitarian assistance, creating sustainable livelihood opportunity for themselves. The vibrant and complex economic systems they are integrated in provide fertile ground for innovative and sustainable opportunities.

Ugandan refugee camps are a good example of a community which has organically evolved to thrive. It shows conspicuous signs of resilience through diversity, dynamic self-organisation and restructuring, but also through its natural mechanisms to build adaptive capacity to survive. However, this example cannot be used as a generality and much still remains to be done in order to provide decent living conditions to refugees around the world.

## **B.2. RECOMMENDATIONS FOR INTERNATIONAL HELP**

There is a strong **need for market-based interventions** that aim to promote sustainable livelihoods based on holistic understanding of existing markets. “Without the detailed knowledge of both locals and displaced populations, drawing a holistic picture of refugee economies would be virtually impossible”. (Betts and others 2014: 41) It is imperative to partner with communities, promote **participatory approaches** and use resources for long-term investment, such as training and skill development. Refugees have skills, talents and aspirations, which interventions should nurture. It is essential to **help refugees help themselves**. There is no need (and no money) for indefinite care and maintenance. Providing access to education, skill development, microcredit, business incubation, Internet is far more powerful. The use of technology is common on a daily basis amongst refugees and displaced populations. **Providing access to ICT, business incubation and transnational mentorship** is an important step to involve refugees in creating sustainable opportunities for themselves and being part of the solution to end their hardship. Refugees are part of the private sector as producers, consumers, and employees. The **role of the private sector needs to be re-evaluated** and different modes of engagement should be considered. (Betts and others 2014)

Such recommendations are not limited to the context of displaced communities, and are also relevant for long-term interventions in other emergency situations.

## C. Other Examples of Resilience Around the World

Resilience is formed by a complex combination of factors and can manifest itself in different ways. In order to gain a better understanding of what can make resilience emerge, this section will showcase three additional examples about economic resilience, energy independence and innovation in education.

### C.1. MICRO-FINANCING FOR FARMERS

As found in Haiti following the response of international aid, as well as in Ugandan refugee camps, economic resilience and financial independence are crucial in order for the people affected to regain suitable living conditions. The following example shows a particular way in which financial independence was given to small Kenyan farmers. Kilimo Salama is an innovative agricultural micro-insurance program created by Syngenta Foundation for Sustainable Agriculture, UAP Insurance, and Safaricom (leading Kenyan mobile operator). Most Kenyan farmers are near-subsistence farmers and are generally completely unprepared to face extreme weather conditions. Kilimo Salama, which means 'safe farming' in Swahili, provides security against extreme weather conditions for tens of thousands of farmers cultivating crops even on a small scale. Each bag of seeds can be insured for 5% of its cost, and all payments are made using M-Pesa. M-Pesa is a mobile phone-based money transfer service used for micro-financing in many African countries, as well as India and Afghanistan. Kilimo Salama uses solar-powered wireless weather stations to automatically monitor the climate patterns around the farmer's land. In case of severe weather conditions, the insurance automatically transfers a payout to the farmer through M-Pesa. The innovations brought forward by Kilimo Salama include: the use of automated weather sensors, reducing insurance operation costs and eliminates the need to visit small-scale farms (allowing in turn for a larger number of insured farmers); the use of an automated payout system, directly linked to customers' M-Pesa accounts; the creation of regional climate trends using sensor data collected to better inform farmers. As the service expands, it has the potential to benefit for both developing and developed nations.

### C.2. MICRO-HYDRO PROJECTS IN NEPAL

Today, 1.3 billion people worldwide live without electricity. There are enormous disparities between the developed and the developing world in terms of access to energy and energy consumption. Access to energy facilitates better health, access to education, economic growth, equality and safety. With electricity, clinics can provide better services and store medicine longer, children can spend less time on domestic chores and more time in school, TV and radio can be used to spread important information, and businesses can flourish by producing more and more efficiently. (UNDP 2014) In energy-poor locations, waiting for an electricity grid is not an option, especially in isolated areas in the Himalayas like Nepal.

In 1996, the UNDP and the Nepalese government partnered to work on providing energy to isolated communities. A big part of Nepal's wealth is its water, however, large-scale hydroelectric projects are expensive and take time to build. The Micro-

Hydro projects were developed to quickly and cheaply build and implement hydroelectric systems within communities. This development model requires the local populations to participate at every step of the process - from digging channels and installing power lines, to operating and maintaining to system once in place. In almost 20 years, nearly 400 micro-hydro power plants have been built around Nepal, providing electricity to over 500,000 people. Not only does the project provide comfort and better living conditions, it also empowers people to develop financial activities and gain independence.

This initiative is a success in the way it has managed to harness natural and renewable power locally to develop economic activity and strengthen communities. Using water to power things is not a new concept, but the implementation method and its scale can serve as an example for many initiatives aimed to build resilience. And because of the locals' involvement in the project, such systems can easily be restored after disruptive events like the 2015 Nepalese earthquake. Tailored solutions and simple technology can be the most effective tools to eradicate energy poverty and create more resilient systems.

### **C.3. INNOVATION IN EDUCATION**

The potential of education in building more resilient systems was previously mentioned and shows relevance for the developing as much as for the developed world. The rigid structure of education in the West is slowly being reformed to accommodate for the diversity and complexity of children. Entrepreneurs and visionaries are starting to look at the developing world for alternative approaches to education. Indeed, those nations are not bound by traditional educational models and are therefore fertile ground for alternative education systems.

Adam Braun is in charge of a non-profit organisation that builds schools in the developing world, and Sugata Mitra (winner of the 2013 TED Prize) is a professor in the UK researching self-directed studies. Together they have been working in collaboration with Microsoft on School in the Cloud and Pencils of Promise to bring quality education to all children around the world. They are creating new learning model giving more independence to the children, engaging them to work collaboratively and connect with information online. (Torgovnick May 2014)

They both recognise the opportunities to learn and experiment in the developing world. Being exposed to more obstacles to overcome on a regular basis, Braun says that children in developing countries show more signs of resilience than in the West. Based on their experience, a few points can be remembered as lessons for the rest of the world. In more traditional educational models, teachers are usually seen as experts. However, "the act of teaching is actually one of the most valuable ways to learn" says Braun. The learning environments they are creating allow children to learn and teach from and to each other, while teachers take on a role of facilitators. Sharing limited resources gives birth to more cooperation, and cooperation tends to increase

children's level of understanding of new content. In the West, children are expected to stay still for entire classes. Physical activity is actually a catalyst for concentration and productivity. The absence of desks can play an important role in the understanding and retention of information. Environments where children feel comfortable to move around or disturb each other seem to be favourable to learning.

## **D. Facilitating Resilience**

Having reviewed various examples and case studies in an attempt to identify what is necessary to build resilience, this final section focuses on the types people and environments that are core to those efforts.

### **D.1. TRANSLATIONAL LEADER**

Successful examples of resilience often show a central figure that acts as a leader or a facilitator, creating strong networks and joining together institutions of various political, economic and social levels. These actors, whether they are designers, entrepreneurs, or humanitarian and development workers, can be seen as translational leaders. "Translational leaders do not dispense with hierarchies; they recognise and respect their power. Instead, standing at the intersection of many constituencies, translational leaders knit together social networks that complement hierarchical power structures. Rooted in a spirit of respect and inclusion, these complementary connections ensure that when disruption strikes, all parts of the social system are invested, linked, and can talk to one another." (Zolli and Healy 2012: 255)

### **D.2. ADHOCRACY**

Translational leaders need to operate in particular environments allowing the organic weaving of networks, which introduces the concept of adhocracy. According to the Oxford dictionary, adhocracy is "a system of flexible and informal organization and management in place of rigid bureaucracy". (Oxford Dictionaries 2015) Adhocracy is "characterised by informal team roles, limited focus on standard operating procedures, deep improvisation, rapid cycles, selective decentralisation, the empowerment of specialist teams, and a general intolerance of bureaucracy." The most effective resilient systems today are generally formed by a complex mix of "public and private organisations, informal social networks, government agencies, individuals, social innovators, and technology platforms, all working together in highly provisional, spontaneous, and self-organised ways". (Zolli and Healy 2012: 264)

This rich pool of knowledge, expertise, power, and creativity is necessary to tackle the ever-changing nature of disruptions. Conventional actors in the response to disruptions must exist but should not intervene alone; space needs to be kept for adhocracy to emerge. In other words, there needs to be a collaborative and nurturing structure where each actor can play to its strengths without impeding others' progress.

Translational leaders have the power to create such structures in which opportunities and connectivity are provided to the different actors, focusing on ‘influence and coordination’ rather than ‘command and control’; and in such structures emerges resilience.

### **D.3. THE ROLE OF THE DESIGNER**

Today, the word ‘design’ is used everywhere, and as self-proclaimed designers are becoming ever more present, the term is losing its meaning. The glorified late-twentieth century archetype is now outdated, and the significance of the designer must be clarified. In my eyes, a designer is a powerful catalyst for change and has three major roles. The first one is the role of a problem identifier. The world is growing in complexity and new challenges are arising. It is crucial for a designer to have a holistic awareness of what is going on in the world and to be able to identify problems that are relevant for the present and the future. The second one is the role of a problem solver. A designer should be able to use creative tools, as well as design thinking principles to tackle those problems. Focus should shift from objects to ideas, and responsible designers should step away from the type of practice that promotes consumerism, and investigate the short and long-term repercussions of their work. Finally, given the two previous roles, the third role is precisely that of a translational leader or facilitator. The designer should be able to create multi-disciplinary work environments to involve people of all backgrounds into the design process and inspire them to be the change.

## **E. In Essence**

Even in the most disastrous circumstances, resilience can emerge to counter disruption. People can get together to organically and spontaneously grow into an organism that alleviates the fallouts of unexpected situations. Such innovative interventions demonstrate extensive collaborative efforts and solid understanding of local conditions.

In Uganda, being part of vibrant and complex economic systems, refugees have adapted to create sustainable economic opportunities for themselves, and to get involved in large-scale trade networks. In order to bring such opportunities to those without as much freedom, the local governments and the international community must get involved.

It has become clear that at the heart of most resilient systems is a central figure that acts as a facilitator, gathering the necessary resources together for progress to occur. The translational leader provides a structure for relevant parties to network and work jointly for a common cause, and this is in my eyes one of the roles of a designer. By providing an informal, flexible and spontaneous structure for constituents of various backgrounds, adhocacy provides the perfect environment for building resilience.

## 6. Conclusions

### A. Lessons from Around the World

Resilience is a delicate combination of properties, which can express itself in different forms, as seen with economic resilience, community resilience, infrastructure resilience or human and social resilience. It is difficult to evaluate in complex systems and is very context-specific. Some of the particular approaches that make a system more resilient might compromise another's strengths. Such systems are generally characterised by their capacity to sense emerging risks, to respond to disruption, to build in a regenerative manner, and to learn and transform over time. (The World Bank Group 2015) In Zolli's words, "there are no absolutes in resilience, no binaries, just measures of more and less". (Zolli and Healy 2012: 260)

Poverty is the main reason for disruptions to become disasters, and richer nations have a significant advantage in their ability to rapidly invest in solutions to mitigate crises. However, shocks and disrupting events are becoming increasingly complex, and the world's both poorest and richest nations are exposed. Today, new measures must be taken by governments and organisations to integrate plans for short-term and long-term interventions to build resilience. Focusing on people to help them become financially independent, enabling participatory and collaborative approaches, relying less on predictions and building stronger communities, and expanding the humanitarian market are all central to these interventions.

"Resilience is, like life itself, messy, imperfect, and inefficient. But it survives." (Zolli and Healy 2012: 14) Building resilience is a continuous learning process and every time a disaster occurs, there are more skills and more knowledge to be learned that are valuable not only for the affected communities, but countries around the world. Exposing a system's fragilities and facing regular disruptions (under a critical threshold) is one of the most effective ways for that system to learn, grow and become more prepared for adversity. This is why there is much to learn from places that frequently face difficulties, from their failures, their suffering and their experience.

### B. Facilitating Resilience

As new challenges arise, it is becoming clear that there is a need for new methods to tackle them. Design thinking principles can serve as a powerful tool to develop innovative solutions to build resilience. The time has come for more traditional organisations to restructure themselves in order to be relevant for today and work dynamically towards innovative practices.

Translational leaders are at the centre of most examples of resilience. They operate in a spirit of cooperation and inclusion, and promote multi-disciplinary collaborations between individuals, the private sector, social networks, large-scale organisations and governments. One of the facets of today's designers is to take on the role of translational leaders or a facilitator, building strong networks and bringing together the resources necessary to make things happen. Such dynamics occur in adhocratic systems where informal social connections, improvisation and self-organisation rule. Adhocracy should be recognised and popularised in the development sector to facilitate innovation by promoting a culture of adaptation and constant improvement and by providing, beyond financial support, mentorship, tools and training.

## **C. The Future of Resilience**

Globalisation and modernisation have brought tremendous improvement around the world; however, they are also responsible for a growing separation between the people and their natural inheritance. It might be time to start re-evaluating progress with different criteria than relentless production and creation of wealth. Maybe if we connect ancient and contemporary, local and global, and reconcile deeply rooted traditions with technological breakthroughs, we may be able to find a way to live in harmonious symbiosis. In the meantime, the concept of resilience is bound to become an increasingly potent driver for innovation, pushing the use of new technologies and services to increase our adaptive capacity and provide better conditions of living for people around the world.

## 7. References

- Alliance Development Works. 2013. *World Risk Report*  
<[http://worldriskreport.entwicklung-hilft.de/uploads/media/WorldRiskReport\\_2013\\_online\\_01.pdf](http://worldriskreport.entwicklung-hilft.de/uploads/media/WorldRiskReport_2013_online_01.pdf)>
- Applebaum, Anne. 2015. 'Why So Many Migrants Are Dying in the Mediterranean', *Slate*  
<[http://www.slate.com/articles/news\\_and\\_politics/foreigners/2015/04/libya\\_is\\_the\\_source\\_of\\_the\\_mediterranean\\_migrant\\_crisis\\_the\\_problem\\_is\\_the.html?wp\\_src=fol\\_tw](http://www.slate.com/articles/news_and_politics/foreigners/2015/04/libya_is_the_source_of_the_mediterranean_migrant_crisis_the_problem_is_the.html?wp_src=fol_tw)>
- Benson, Charlotte, and Edward J. Clay. 2004. *Understanding the Economic and Financial Impacts of Natural Disasters*  
<<http://elibrary.worldbank.org/doi/abs/10.1596/0-8213-5685-2>>
- Betts, Alexander, and Louise Bloom. 2014. *Humanitarian Innovation: The State of the Art* <[https://docs.unocha.org/sites/dms/Documents/OP9\\_Understanding\\_Innovation\\_web.pdf](https://docs.unocha.org/sites/dms/Documents/OP9_Understanding_Innovation_web.pdf)>
- Betts, Alexander, Louise Bloom, Josiah Kaplan, and Naohiko Omata. 2014. *Refugee Economies: Rethinking Popular Assumptions*  
<<http://www.rsc.ox.ac.uk/files/publications/other/refugee-economies-2014.pdf>>
- Birmingham, Lucy. 2013. 'Two Years After Fukushima, Japan Worries About the Next Big Quake', *Times* <<http://world.time.com/2013/03/10/two-years-after-fukushima-japan-worries-about-the-next-big-quake/>>
- Blasiak, Robert, Sana Okayasu, and Ikuko Matsumoto. 2012. 'Deep Roots of Community Resilience', *Our World* <<http://ourworld.unu.edu/en/deep-roots-of-community-resilience>>
- Brown, Tim. 2009. *Change by Design* (Harper Collins)
- Clermont, Carine, David Sanderson, Anshu Sharma, and Helen Spraos. 2011. *Urban Disasters - Lessons from Haiti* <<http://www.dec.org.uk/sites/default/files/pdf/dec-haiti-urban-study.pdf>>
- CRED. 2009. 'EM-DAT | Natural Disasters Trends' <<http://www.emdat.be/natural-disasters-trends>> [accessed 30 September 2015]

- Friends of Europe. 2013. *Building Resilience: Lessons from Post-Tsunami Japan*  
<<http://www.friendsofeurope.org/media/uploads/2014/10/FoE-Report-BuildingResilience-2013-WEB.pdf>>
- Greenpeace. 2015. 'IAEA Fukushima Report Downplays Radiation Risks and Ignores Science - Greenpeace'  
<<http://www.greenpeace.org/international/en/press/releases/IAEA-Fukushima-report-downplays-radiation-risks-and-ignores-science---Greenpeace/>>
- Groupe URD. 2013. *Humanitarian Aid on the Move, Nature*  
<<http://dx.doi.org/10.1038/430730a>>
- Hussain, Misha. 2013. 'Resilience: Meaningless Jargon or Development Solution?', *The Guardian* <<http://www.theguardian.com/global-development-professionals-network/2013/mar/05/resilience-development-buzzwords>>
- Kim, Victoria. 2011. 'Japan Damage Could Reach \$235 Billion, World Bank Estimates', *LA Times* <<http://www.latimes.com/business/la-fgw-japan-quake-world-bank-20110322-story.html>>
- Maki, Norio. 2013. 'How Resilient Is Japan? Response and Recovery Lessons from the 1995 Kobe and the 2011 Tohoku Disasters', *Fukushima Forum*  
<<https://fukushimaforum.wordpress.com/workshops/sts-forum-on-the-2011-fukushima-east-japan-disaster/manuscripts/session-1/how-resilient-is-japan-response-and-recovery-lessons-from-the-1995-kobe-and-the-2011-tohoku-disasters/>> [accessed 30 September 2015]
- McClellan, Denis. 2012. 'Are We Capable of Learning the Lessons of Haiti?', *UNSDR*  
<<http://www.unisdr.org/archive/24946>> [accessed 1 January 2015]
- Le Monde. 2015. 'Plus de 300 000 Migrants Ont Traversé La Méditerranée Depuis Janvier', *Le Monde* <[http://www.lemonde.fr/europe/article/2015/08/28/plus-de-300-000-migrants-ont-traverse-la-mediterranee-depuis-janvier\\_4739196\\_3214.html?xtmc=219&xtcr=3](http://www.lemonde.fr/europe/article/2015/08/28/plus-de-300-000-migrants-ont-traverse-la-mediterranee-depuis-janvier_4739196_3214.html?xtmc=219&xtcr=3)>
- Oxford Dictionaries. 2015. 'Adhocracy', *Oxford University Press*  
<<http://www.oxforddictionaries.com/definition/english/adhocracy>> [accessed 29 September 2015]
- The World Bank Group. 2015. 'Big Data for a More Resilient Future | World Bank Live'  
<<http://live.worldbank.org/big-data-for-a-more-resilient-future>> [accessed 29 September 2015]

- The World Bank: Urban Development and Resilience Unit. 2014. *An Expanded Approach to Urban Resilience : Making Cities Stronger (Draft)* </>
- Torgovnick May, Kate. 2014. 'What Can the Western Education System Learn from the Developing World?', *TED Blog* <<http://blog.ted.com/what-can-the-american-and-british-education-systems-learn-from-classrooms-in-the-developing-world/>> [accessed 29 September 2015]
- UN Habitat. 2012. *State of the World's Cities 2012/2013*  
<<http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3387>>
- UNDP. 2014. 'Action For Energy' <<http://www.action4energy.org/>> [accessed 29 September 2015]
- UNHCR. 2015. 'Uganda' <<http://www.unhcr.org/pages/49e483c06.html>> [accessed 29 September 2015]
- UNISDR. 2004. 'Terminology: Basic Terms of Disaster Risk Reduction'  
<<http://www.unisdr.org/2004/wcdr-dialogue/terminology.htm>> [accessed 29 September 2015]
- Usher, Oli. 2013. 'Risk and Resilience in Japan after the Fukushima Disaster', *UCL Blogs*  
<<https://blogs.ucl.ac.uk/events/2013/11/22/risk-and-resilience-in-japan-after-the-fukushima-disaster/>> [accessed 29 September 2015]
- Zolli, Andrew, and Ann Marie Healy. 2012. *Resilience: Why Things Bounce Back* (Simon and Schuster)