1. Culture and risk

This Section introduces the slippery concept of 'culture' and how it can be recognised but also misrecognised. It also explains why culture, while admittedly a potential source of frustration and misunderstandings, is also an important asset in dealing with disaster risk.

1.1. How to recognize culture

Author: Karen Engel, Jeroen Warner

Because cultural aspects are present at multiple levels of an organization, of a group and of an individual, culture can be elusive and overlapping, which makes it difficult to 'notice'. Misunderstandings can happen between people from a similar culture, so between two groups originating from a different faith, profession, or country, they are likely to have much greater consequences. And yet, recognizing it is challenging.

Based on a wide literature scan, we find the following traits of 'culture':

- Cultural aspects are relevant and common to a particular group and subsequently binds the group members together;
- Culture is meaningful and highly valued by a particular group;
- Culture is profoundly implicated in motivating people to think, interpret and judge the world and do the way they do;
- Culture is learned. It is transmitted from generation to generation and internalized to such an extent that it becomes 'second nature' and is largely taken for granted;
- Culture is arbitrary and not 'natural'. The actual nature of a group's culture is the result of their decision-making processes. It could have been completely different;
- Culture encompasses 'problem-solving tool[s] that enable individuals to survive in a particular, environment' (Schein, 1999);
- People can belong to different cultural groups;
- Culture and power are intimately linked. (Inglis 2005:9-10)

Different cultural elements can be differentiated:

- Manifestations, such as art, ideas, communication, artifacts, tools, rules, and laws;

- Beliefs, values, and worldviews, such as ideologies, assumptions, and attitudes;
- Knowledge, such as scientific knowledge, local knowledge, and indigenous knowledge;
- Social structure, such as agency, relationships, social networks, social control and power;
- Behavior and practice, such as customs and norms, rituals, and traditions. (Thomalla et a. 2015: 9).

Some of these elements are more visible than others. Most are invisible and so fundamental to people that they are difficult to negotiate about.

While useful, these definitions are from the outsider view. From an insider perspective, culture is 'that what which is considered „normal"; "the way it's done ''round here". Much of culture is hard to identify and explain to others, because it has been internalized, comes naturally, and this self-evidence facilitates routines and social organization. This is particularly difficult for newcomers who are not socialized into the culture and will have to discover it most likely through a process of trial and error. Generally, cultural differences come to the surface most frequently when two cultures come together and collide. In case of a collision, there will most likely be a clash ('ouch!') moment accompanied by friction and possibly even more overt conflict. This is because we inevitably see and judge our environment, our fellow human beings and ourselves through the lens of our own cultural background. When for instance, two aid workers work together on a case but learn that they interpret the risks of the situation completely differently. Is one wrong and the other right? Or are they interpreting the situation in accordance to different norms and values?

To meaningfully recognize culture it is therefore key to be continuously aware of one's own reactions towards others and in particular the question marks that appear when interacting with others. One functions, interprets and more importantly judges surroundings and others in accordance to one's own culture. However, what may be normal to one might not be to the other. So when interacting with others, be alert to feelings of perplexity and shock and before escalating the situation to hostile confrontation, wonder what it is that puzzles you and engage in an inquiring fashion with the other. Are there cultural assumptions underlying their act and/or your reaction?

Such question marks generally point at a possible cultural difference. Why don't Dutchmen wear helmets when cycling through heavy

traffic? Why do many Byzantine and Ottoman buildings have beams placed intermittently around walls of buildings (Bankoff 2014: 58)? Are they decorative or might they even have a seismic function? Such observations and questions allow one to learn about the environment one is in. One could, for instance, learn that when a community has areas where homes are built on stilts that flooding is a relevant phenomenon for the people of the community. In other words, recognizing culture will not just enable one to increasingly cooperate or understand why cooperation with others is maybe difficult, but it will also open the door to learn more about the environment one is in and the way people interpret and deal with that environment.

Beware: introspection can be confrontational. You will be looking into your most inner self and possibly have to question fundamental assumptions which have been, up and until that day, the basis of your essence, while realizing that they are arbitrary and can, if you want to, be different. The key is first to identify and reflect on the cultural differences and then find a way to move forward that is acceptable to both parties. That is when it gets difficult, especially when such inner elements as values and norms are being questioned.

There are various social interactions that require thoughtfulness in light of the possible cultural implications they could entail. Firstly, one has to be aware that people are generally part of different cultures. As a result, even though you are part of the same organization and share the organization's culture, you might still experience culture clashes because competing cultural values or norms take the upper hand. For instance, families can have their own cultures and in a specific situation this culture's elements might be considered more weighty than for instance the organization's. In situations in which the organization's culture does not provide sufficient guidance a member may resort to his or her own cultural values that would.

Part of these types of cultural interactions are interactions between people with different ethnic or religious backgrounds within one organization. However, people with the same religious and ethnic background can be part of quite different cultural groups. Secondly, cultures can interact between groups when working with different organizations. Civil and military organizations for instance can have very different cultures. A mission for a military unit, for instance, starts when you leave your home and ends when you get back home. For a civil organization, a mission is when you leave your quarters in the host country to, for example, do search and rescue activities and ends when you get back to your quarters. This different interpretation of a mission can

cause friction. Similarly, there can be serious cultural clashes between a professional organization and a community one.

Culture is quite functional: it enables people to interpret and judge the world around them, i.e. order, and function more effectively without continuously having to cognitively engage with one's surroundings. It prevents one from being taunted by hyper-reflection like the centipede in the following poem:

'The Centipede was happy quite, / Until a Toad in fun / Said, 'Pray, which leg goes after which?' / And worked her mind to such a pitch, / She lay distracted in a ditch / Considering how to run' (Katherine Craster 1841-74).

Furthermore cultural elements have a cultural logic and function. In case of hazards for instance, communities tend to cultivate elements that will enable them to understand and deal with the events and prevent, as much as possible, dismay. As a result, culture affects how people understand risks and guide the way they act in light of these. A collection of cultural elements cultivated to deal with a recurrent hazard is known as a disaster subculture. Disaster subcultures emerge when communities are repeatedly affected by potentially disastrous hazards and members take each disastrous occasion to learn and improve their capabilities to deal with these phenomena so that they will be less disastrous in the future. Since these elements have meaning and are valued by communities experiencing disaster risk, they have to be taken into account in DRR (Warner and Engel 2014).

They can be valuable resources, but they could also be the cause for strenuous relationships. They can for instance be the reason why a certain community does not want to implement some solution experts have come up with.

Since it is known that cultural interactions will be an important part of one's work in DRR and the success of one's interventions will stand or fall by the way they are dealt with it is worthwhile looking into cultural implications in 'peacetime'. As such, one can determine to what extent culture can be an opportunity or is rather a challenge to be dealt with and identify ways to deal with these. When you have to do this during an emergency, you are too late. In an emergency there is no room for hyper-reflection and the possible immobilization this might entail. People have to largely turn to automated behaviour, particularly also to have enough cognitive space to deal with unexpected situations. This means one should focus on encountering and dealing

with different cultures in the preparation phase. This can be done in different ways. For instance, one could include in every after-action report an appraisal of cultural matters. Also one could make it part of the preparation phase by including a cultural appraisal when doing for instance a network analysis. Key tools are generally, qualitative in-depth and group interviews and continuous interaction and reflection with relevant people.

It is also recommended to not just think of potential 'problem groups' when it comes to planning and preparing for disaster. There are cultural groups networks that could contribute to one's DRR efforts. Take for instance, boy and girls scouts, voluntary rescue brigades and hobby groups like electrical clubs or radio aficionados. Such groups might have certain knowledge and technical skills that can prove really helpful during a disaster.

1.1.1. Technoculture

Complex technological systems tend to be seen as the most optimal way of dealing with various natural hazard related problems. While these can be of help, a sole dependence on them can have adverse effects. In Dordrecht, for instance, the decreasing exposure to flooding has brought complacency and forgetfulness. In the South of the Netherlands, however, (non-life threatening) flooding used to be frequent and as a result relevant risk awareness, knowledge and capacities tends to be more widespread there than in the west of the Netherlands that has already been fully diked up. Today embankments have been installed in the southern province of Limburg and communities there are being told flooding will no longer be part of their lives. This will most likely lead to a reduction of flood preparedness, even though the possibility of flooding remains. The probability might be small, but is still above zero (Engel et al 2014).

Unnecessarily exposing people to disaster risk is not an option. However, believing that one can master nature is not either. A middle road would be to cultivate an intelligent mix of technical and human capacities that will not just enable higher levels of resistance, but also significant levels of resilience. Also, to ensure technical systems are properly embedded in a community and do not force communities into highly dependent relationships with for instance experts, especially when it comes to early warning systems. In light of DRR it worthwhile that people can interpret their environment and in particular

threats that might be imminent. Often time is of the essence and it is thus disadvantageous for people to have to wait for vast complex socio-technical systems to inform them. Such systems generally require time that is unavailable and in addition often encompass numerous linkages that can fail. It may be better to make tools or facilitation availability for community members to be actively involved in their own safety and prevent a false sense of security from arising, confer, for example, Dutch dike teams (trained to put metal sheets in front of vulnerable buildings) and 'dike armies' (patrolling the defences when the weather gets rough).

Suggestions for Further reading

It is recommended to map local skills and repertoires, as well as the 'risk landscape' people perceive. There are good guides to participatory action research

You may find the Reachingresilience.org handbook useful in this respect.

A Swiss example:http://www.polsoz.fu-berlin.de/ethnologie/personenliste/froemming/Participatory-Mapping-of-local-Disaster-Risk-Reduction-Knowledge_-Reichel_Froemming.pdf

1.2. Culture: why it is an asset

Author: Peter Tamas

When we are under stress, as in a disaster, we will revert to known familiar patterns. These patterns tell us where to go for information, who to trust, what we should do and with whom we should do it. They will tell us who we must look after and they also tell us who is obliged to look after us. Most of these patterns will tell us to trust, to share with, to help, and to be helped by the familiar. All of this happens without our thinking. These patterns are conditioned. This means that when there are distinct groups in a city they will have strongly conditioned patterns that link them to other members of their group. These patterns are usually difficult, if not impossible, for outsiders to see. They, however, are far more durable than what people have learned, for example, in training sessions in which people are told about early warning systems for floods. This conditioning will survive a generation or two after a population immigrates. If disaster responders rely on

training and information, they will likely fail. This information provided by outsiders is easy to reject. If disaster responders partner with members of the community and if, together, they become part of the tendencies, the conditioning, of that population, then they we will be able to leverage the assets, the strengths, the conditioning of that community so that they both look after themselves better (they will be first responders) and such that their actions are more compatible with those of the professional disaster response community.

1.2.1 Why our comfort zone matters and what to do about it

When we have time and energy and when we are feeling relaxed and competent, we willingly work at the edge of our comfort zones. This is when we are happy to try chicken feet stew for supper and shisha for desert...and find both desirable though perhaps not in the same night. The minute we are stressed, however, we will snap back to where we are comfortable. There is no way to avoid this snapping back and it would be foolish to try. When we are in our comfort zone we can think and act faster. We get in trouble when our comfort zone is not where we need to be to perform well. The only strategy available is to change what we find to be natural, to change what is comfortable, to change what counts as our comfort zone so that it is where we need to be when we are under stress.

The things we do, and the things that we do not, talk about – they matter.

Professionals do particular things in particular ways that are recognized to work. In addition, we are professionals in part because we talk about the right sorts of things in the right sorts of ways. Sometimes having some topics off limits is a good thing. There is no reason in professional conversations to talk about how bloated and constipated you are today…unless you are an adult performer preparing for a scene in which your bowel condition matters. While both may be very important, neither belong in most professional discourses. What counts as professional, like our culture, has taken generations to form and it changes slowly. Some of the things that we talk about do not help and there are some things that we avoid discussing that we should talk about. For example, both police and the military are still figuring out if and how to talk about mental health. Real men, they are learning, do cry and this, it seems, might be good to make part of professional

talk. When disaster responders look at other communities there are all sorts of things that we do not think and/or do not say. We might, for example, label a Muslim community in some slightly insulting way and not talk about how in makes us uncomfortable to deal with women wearing head-scarves: it might be OK to label others but not OK to talk about our own discomforts. These patterns matter. Talking about others in simplistic terms draws lines that then become harder and harder to cross and not talking about our own discomforts makes it impossible for us to take the first, and necessary, step.

It is difficult to identify and deal with 'unmentionables' and 'undiscussables'. For those who are in a culture, one way to begin to find undiscussibles is to look for discomfort. Discomfort is a flag that we have talked about something that is not proper. In most situations our reaction to mention of an undiscussable is analogous to a loud belch at the dinner table: we don't see it, we minimize it, we make a joke of it, and, whatever we do, we quickly move on and pretend it did not happen. These strategies minimize disruption. They help us keep on with business as usual. Too bad for us that our business as usual is not good enough. If we have decided that the way we do things is not good enough, when we trip over an undiscussable the correct strategy is to stop, to flag it with a statement along the lines of 'I just saw/heard a belch. That didn't feel right.'

Having undiscussables makes our work efficient. It reduces what we can and need to think about. They work great until we are in a different world. The minute we are in a different world, we need to question what we do and do not talk about. Fundamental to these discussions is something called 'metacognition' which is essential to something called the relational model of intercultural communication (Imahori and Lanigan 1989).

1.2.2. Proxy indicators

When we look at people we make intuitive judgements about them. The Dutch, for example, say 'trust me by the blue of my eyes.' In this case blue eyes are a proxy indicator of trustworthiness. We have all sorts of proxy indicators that matter in a particular culture: the firm handshake, the straight gaze, the confident voice, being male, being clean shaven, being well dressed, using appropriate vocabulary, driving the right car. None of these measure what we are actually interested in. They, and many others, might work well enough in some contexts. When we move to new contexts, however, these proxy indicators mi-

ght not work and we won't know when they fail. This means that when we are working in new environments we can't trust our intuition. Intuition, however is very convenient. It lets us make fast decisions that, when in the right circumstances, work well enough. Intuition will get us in trouble unpredictably when we are not in familiar circumstances. This means that we have to make every decision deliberately. This takes time and effort. In a disaster, when the unthinkable happened nevertheless, we don't have time and we are exhausted. This means that we will not be able to make deliberate decisions. We must, therefore, train our intuition before a disaster so that the proxy indicators we have are good enough for the full diversity of communities we will work with in a disaster. This will take time and energy up front.

1.3. (Mis)recognising Culture

Author: Peter Tamas

Today disaster responders have to deal with many different kinds of people. We will take a quick glance and make initial decisions about the characteristics of that group and, on that basis, decide what we can and should do. If we are going to deal with people from that group, we will use our group based classification as a starting point for figuring out who that person really is. While this sort of decision making serves us well most of the time, there are a few ways in which they get us in trouble.

1. The rules we have for classifying people took many generations to evolve. They might fit the world of our grandparents. When we are in new circumstances, as we are in any major European city, and we use old rules to classify new people, they will fail in ways we cannot predict and often cannot even see.

2. We are invested in our rules. We do not like it when they are wrong and we will persist in using them even when they don't fit quite right.

3. When our rules do not fit quite right, rather than parking the rules and starting from scratch our initial response will often be to get a bit grumpy and try to make them fit.

4. Once we have figured out that they do not fit and we start from the ground up, the group based decisions we make will still be sticky. It will take time and effort for us to adjust

5. When we are under stress, we do not think twice. We will revert to

simple rules and stick with the group based decisions they suggest

6. Most of what is happening here is not conscious. This means that just learning will not fix what we do. Learning happens between our ears. Most of the decisions we make here are more gut-level intuitive calls.

It is possible for us to learn new things. We may, for example, learn how to work with people who are really quite different, people who behave in ways we initially thought were not good. This sort of boundary crossing work has to be done in consort by people on both sides. This is extra work that takes time and effort. In normal circumstances this if fine. We have the time and head space required to reach out, to make links, to figure out what is going on and how to work together. Under stress, however, we will all revert to the familiar and the efficient.

Putting this all together, all of the work that we do figuring out contact people in distinct groups, all the time spent going to meetings, all the time we spend building trust, may very well come to nothing. When the disaster strikes, we will all tend go back to are primal thinking: making quick judgments, clumping people into groups that are easy to think about, sticking to the familiar and doing what makes sense to me and those who think like me. Under stress our natural reaction is to kill off all of the careful thinking, all of the nurtured relationships, all of the individual understandings that let us see people rather than classes. In a disaster, our natural tendency is to crawl back into the culture, the shell, that is most familiar.

The only way to get to the point where, under stress, we go in the right direction is through conditioning. This is well known to the military whose training revolves around the saying 'train as you fight, fight as you train.' The only way to work effectively with diverse cultures in disaster is to fully integrate that diversity into preparation…so much so that it becomes impossible to think any other way.

1.3.1. Implications

To work effectively across cultures both disaster responders and members from the diverse groups who make up their cities must be conditioned. This means that, at every step of the way, we must not only be sharing or informing, we must be behaving in ways that build and use the relationships and the trust on which lives will depend

in a disaster. This will be difficult because conditioning is far more expensive than training.

When the disaster is not pressing, with the exception of one organization, it is very hard to justify the time and money required for conditioning. Armed forces know about conditioning. They regularly second staff to work in other organizations. These other organizations are pleased to host these seconded solders. Further, in the military, approximate 1/3 of staff hours are spent in some form of training and this does not count all of the rituals that structure feelings and behaviour in ways that are useful for combat. This ratio is not supportable in almost any civilian organization. In civilian organizations, people are paid for what they are doing during a day and hired because they know how to do it. This means that time is fully committed to immediate tasks. Resourcing for current task loads means that there is no time required to design and undertake the sort of conditioning that will save lives when it matters.

It is difficult to talk about building conditioning into civilian organizations but it is possible. It can be made part of our jobs, our job descriptions, our performance review, our organizational culture. Our jobs can pay us to engage and our organizational culture can encourage us to find comforts in the diverse communities in our cities. This may be as simple as where we choose to get lunch together, who we work with on the annual litter picking day or where we recommend incoming colleagues look for housing.

It is, however, illogical to talk about building conditioning into the diverse communities that make up our cities. People do what makes sense to them today and our organizations can change what makes sense so that we are nudged towards engaging across difference. This does not work in private lives. The only way to build conditioning into the cultures of those we wish to serve is by going to them, by working with them on their terms to do what is important to them today, recognizing that what is important to them today may very well not matter all that much to us. If we do this for a long time we will build relationships, we will build trust. Working with each other will become part of who we are It is precisely the relationship and the trust that will matter in a disaster. Police have known this for at least a generation. The whole institution of community policing was and remains a seismic shift in what it means to police. More importantly, it is a fundamental change in what it means to be a police officer.

If we are to work effectively in our increasingly diverse and always

changing cities, we can learn from the police and the armed forces. With the armed forces, we must make the time, the resources and the effort required to condition ourselves such that, when stressed, we behave appropriately. With the police, we must change how we are in our cities so that the time we spend those who become our neighbours and friends alters their conditioning such that the, under stress, also behave appropriately.

If we get culture right, then the improbable and the illogical becomes instinctive.

- we will leverage the bonds from which the diverse communities that make up are cities are built.

- we will see ourselves as part of those communities, as supporting them so that our new friends and neighbours, when they respond first they will do so in a way that both preserves lives and integrates with the professional response that will quickly follow.

2. Culture and risk: path dependencies

After devastating disaster, many understandably would like nothing more than to 'move on' and start afresh. 'Building back better' on a disaster site points the way to a brighter future. However, we would be remiss to forget about the past. This chapter looks at the crucial importance of cultural heritage, followed by cultural memory, for growing or maintaining a 'safety culture' and understanding differential responses to disaster events.

In fact, disasters are important identity shapers. Cultural identity is bound up with history: disasters deeply shape people's sense of history (at national level e.g. in 1953 for the Netherlands) and in so doing shape culture. Historical choices tend to have a path dependency impinging on future developments. But also the ''shadow'' of past treatment may hang over the acceptance of help and acceptance of preventative measures. The cultural background of society, and the cultural filter through which hazard information is interpreted and adapted to, are continually changing as the balance between risk and mitigation alter (Alexander, 2000).

Communities have proven to learn from shocks and transform their cultural systems to ensure the reduction of future impact of recurrent events. The variations over time indicate that cultures are not static, but are continuously evolving. Changes, however, take time and do not come about over night as they have to be socially desirable and accepted and valuable to the community at hand. In addition to variations over time, there are also variations within cultures or subcultures. For instance, communities confronted with specific challenges to their livelihoods like recurrent hazards, often develop an assortment of techniques, tools and artefacts to effectively deal with the hazard at hand.

This means that it is important to recognize that 'one size fits all' solutions are not likely to work when it comes to dealing with culture(s).

2.1. Cultural heritage and disaster in today's cities

Authors: Helena de Jong, Miranda Dandoulaki

The last decades have seen a series of disastrous events that were costly in terms of cultural heritage. Fires, earthquakes, flooding, tsunamis, land and mud slides, wind, and storms are among the major causes of loss and damage of cultural heritage.

Cultural heritage is commonly defined along the lines of 'the archaeological and historical built environment and moveable heritage' (Taboroff in Kreimer et al., 2003). This heritage serves a role in preserving local identity and personality, but also local knowledge; preserving heritage has educational purposes in awareness raising, as the layout of a city (plazas, avenues), the construction of buildings (for example earthquake resistant) and infrastructure (multiple escape routes) may reveal a logic that is often more in tune with urban exposure to natural hazards than today's urban development. The following definition of cultural heritage is used by UNESCO: ''the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations'' (UNESCO website).

Cultural heritage is seen as a major component of quality of life and plays an important role in society and community wellbeing (Tweed and Sutherland, 2007). The loss or deterioration of heritage can seriously affect local and national communities for several reasons:

2.1.1. Cultural heritage has important symbolic and material value for community identity

Direct contact with cultural heritage enables history to come to life, and contact with culture inspires, humanizes, and enriches people, Alexander (n.d.) noted. Cultural items, he continues, contribute to the 'spirit of place'. When a disaster occurs, the destruction of this 'spirit of place' can weaken a person's sense of identification with a place and affect the determination to rebuild. On the contrary, a strong 'spirit of place' can inspire disaster survivors to overcome the obstructions they face due to the disaster and reconstruct not just their functional environments but also those that represent their heritage (Alexander, n.d.). The psychological impact on communities due to the loss of cultural heritage to which they are closely associated should not be underestimated. Local communities and individuals feel a socio-psychological need to see and feel that the familiar environments with which they identify are not totally wiped out (Wijeratne in ICOMOS, 2008).

Milko Morichetti, an Italian art restorer, expresses this sense of identification as follows:
"Without the culture that connects us to our territory, we lose our identity. There may not be many famous artists or famous monuments here, but before anything, Italians feel proud of the culture that comes

from their own towns, their own regions. And when we restore a church or a museum, it gives us hope. This is not just about preserving museum culture. For us, it's about a return to normalcy" (Medina, 2009)

Moreover, during the post-disaster and post-conflict phase, heritage landmarks and the continuation of traditional cultural practices may contribute to the recovery of a community and help vulnerable people recover a sense of dignity and empowerment (UNESCO website).

2.1.2. Cultural heritage has socio-economic value for cities

The historic built environment not only provides a city with character and a sense of identification for local communities, it can also boost the local economy and create jobs. Cultural heritage is repeatedly identified in both academic literature and policy documents and by regional and national governments as an economic source that can provide employment and realize profit and local development (Loulanski, 2006). Heritage and its preservation have long been regarded as oppositional to economic development (it is either historic preservation or economic growth) but they are increasingly seen as effective partners in development, as Loulanski (2006, p.56) argues. By investing in cultural attractions and infrastructure, cities seek to secure a niche position on the international tourism map. Tourism also represents an important source of financial resources for the preservation and restoration of the heritage (Russo and van der Borg, 2002), including traditional crafts, practices, skills and knowledge. It is for instance noted that in Europe, heritage is vital to the competitiveness of tourism, which is valued at 586 billion euros per annum and employs 9.7 million people (Jigyasu et al., 2013).

Moreover, cultural heritage attracts investments and promotes locally based jobs related to a wide range of activities such as tourism, conservation, construction, arts, and the production of crafts. It is therefore also a powerful asset for inclusive economic development (Jigyasu et al., 2013).

Disasters therefore not only cause material damage to heritage sites but they may also severely affect the livelihoods and the incomes generated through cultural heritage.

Figure 2.1.1 Flood boards in Dordrecht, the Netherlands

2.1.3. Cultural heritage may serve as a source of resilience to communities

Heritage can play an important role in reducing a disaster's impact on people's lives, properties and livelihoods (IFRC, 2014).
Cultural heritage in both its tangible and intangible forms may serve as a factor contributing to the survival of communities from disasters, both psychologically and materially. Traditional knowledge systems embedded in cultural heritage can play a substantial role in DRR (Jigyasu et al., 2013). Disaster risk may for example be reduced through traditional knowledge associated with environmental management and building techniques (IFRC, 2014). Cities, their identity and building techniques are for a great deal influenced by their environment and the threat of hazards. People adapt the built environment to adjust to living with risks in places where they are frequently exposed to hazards. These patterns become embedded in cultures over time (Moore, 1964 in IFRC 2014, p. 124).

This accommodation is reflected in the design of buildings and the materials and construction techniques[1]. Heavy earthquakes in Southern Europe have for instance spurred major changes in architectural design and practice on several occasions (Buforn et al., 2004 in Bankoff, 2015).

1 Important to note however is that these architectures are the result of a whole range of socio-cultural factors, not just the threat of hazards

In Dordrecht, the Netherlands, so called flood board are positioned in flood prone streets to prevent the water from entering shops and houses.

Moreover, traditional knowledge developed over time, enables communities in risk prone areas to recognize changes in the atmosphere, or the behaviour of flora and fauna, and prepare themselves (Jigyasu et al., 2013).''Protecting heritage from disasters is, therefore, not a luxury, but a fundamental consideration to be given priority together with other humanitarian concerns (…)'' (IFRC, 2014, p. 123).

From the above, the following points are distinguished that may harness the strength of culture as a tool to reduce disaster risk (see also Jigyasu et al., 2013).

- Draw on traditional knowledge and blend scientific knowledge and technological advances with capacities and resources already available at local level

- Draw on traditional building techniques and locally available material as to inform modern day practice

2.1.4. Protecting and preserving cultural heritage

Cultural heritage is often concentrated in urban areas where trading and business activities have spurred the production of different displays of religious, civic, and private creativity. Such cities are often located in disaster prone areas, for example in coastal areas or alongside rivers or close to fault lines, and therefore vulnerable to natural disaster (Taboroff in Kreimer et al., 2003).

When disaster strikes, the loss of cultural heritage causes a wide range of destructions. Well known examples are the Italian city of L'Aquila where the earthquake of April 6, 2009 caused the destruction of many of the city's historical and monumental heritage. Amongst others, several churches, the city's oldest gate built in 1548, and the National Museum of Abruzzo, housed in a 16th century castle, have collapsed and/or are too unstable to enter. Another EDUCEN case study, the Italian region of Umbria, a landlocked region in the centre of Italy, has been hit hard by a series of earthquakes in August and October 2016. Damage to cultural heritage has been severe. In Norcia, one of the affected towns, the Basilica of St Benedict dating back to the

Figure 2.1.2. The Basilica of St Benedict in the town of Norcia after the earthquake

XIV century, survived the August shock but the force of the October earthquake proved too powerful, and caused the church to collapse.

In Istanbul, the likelihood of a devastating earthquake is estimated at 62% within the next 30 years. Istanbul is not only the financial, commercial and industrial centre of Turkey, producing 56.6% of the nation's export, but is also the cultural cross-roads of eastern and western heritage. The city has the highest number of museums of the country and hosts some of the most important monuments of the Roman, Byzantine and Ottoman Empires (Johnnides, 2010).

Despite the serious nature and consequences of the destruction or damage of cultural heritage, the number of heritage properties that have developed a proper DRR plan is surprisingly low (UNESCO 2010). Nevertheless, the last decades have seen several initiatives at international and regional levels in the field of cultural heritage and DRR. These initiatives aim on the one hand to introduce DRR into heritage protection and management, and on the other to intensify and mainstream heritage concerns in larger DRR initiatives (Jigyasu et al., 2013). [2]

2 An overview of key international conferences, workshops, training courses and publications on disaster risk reduction of cultural heritage can be found in the Jigyasu et al., report 'Heritage and Resilience. Issues and Opportunities for Reducing Disaster Risks' (2013: 50).

A major challenge for the protection and preservation of cultural heritage is the fact that it is managed through a very diverse set of ownership or management arrangements, including among others private foundations and national and local governments. To reduce the risk to cultural heritage, heritage managers have to collaborate with disaster management authorities, universities, NGOs, political leaders at national and local level, the private sector, and the public.

The commitment of local governments, in particular mayors, is also vital to the protection of cultural heritage and DRR. In 2012, mayors from cities throughout Europe adopted the 'Venice Declaration on building resilience at the local level towards protected cultural heritage and climate change adaptation strategies'. Fostering partnerships between these different actors and that protect and draw on cultural heritage- on international, regional, and local level- for DRR is therefore vital.

2.1.5. Dilemmas in reconstructing cultural heritage after disaster

As explained above, disasters often severely damage the built environment and in it immovable tangible cultural heritage. Individual buildings, groups of buildings, whole neighbourhoods and settlements of historic or vernacular (traditional) character, under preservation status or not, are damaged at various degrees or even collapse. It then becomes a major issue to decide what to keep from what existed before the disaster and at what price in terms of resources, money and time.

Difficult trade-offs present themselves in a time when pressures to the response mechanism are severe and often overwhelming. Should all buildings deemed to be dangerous be demolished as soon as possible and what procedures should be followed? Should owners of dangerous historic buildings be allowed to proceed with engineering interventions for removing dangerous elements or even for the demolition of the dangerous building? In case of listed historic buildings that are deemed damaged beyond repair, should protection of heritage be considered to prevail over protection of lives? Apart from historic buildings and monuments, what should be done with damaged (in some cases damaged beyond repair) traditional buildings and neighbourhoods that are not listed as monuments to be preserved? How long should recovery be delayed in order to protect tangible cultural heritage either already listed or not? Who should deal with such

trade-offs and make decisions and how should this be arranged?

Especially in earthquake disasters, damaged buildings can be dangerous for people, for instance during aftershocks. Even more, people feel threatened by buildings; old buildings are often seen as dangerous without exception. In these conditions, preservation of existing buildings and neighbourhoods appears to be a luxury at best and an unnecessary present threat and future risk at worst. In the midst of emergencies and urgent needs, it takes a long term outlook to see the significance of heritage for future quality of life and sustainable development.

Every disaster is unique in its socioeconomic, historic and geographical context. There is no one-size-fits-all prescription towards the protection of cultural heritage in a disaster. There are

Saving historic and vernacular buildings after the Konitsa, N. Greece, earthquake disaster

Konitsa is a remote town in Northern Greece. In the '90s, it was a town of about 5,000 people mainly living on agriculture and services. Parts of the town and many buildings were of a vernacular form. There were also numerous listed monuments and historic buildings.

In 1996, Konitsa suffered an earthquake disaster. A first destructive earthquake caused severe damage to the building stock and great fear to the people. Yet, it was the main shock a week later that caused devastation and panic. The population did not have previous earthquake experience.

After the devastation, the population and the Municipality put pressure for the demolition of all old damaged buildings. Even buildings under preservation were at risk from demolition in haste. A trusted central government agency responsible for earthquake protection intervened and acted as consultant to the Municipality, advocating for the protection of vernacular and historic buildings and for preservation of the image of the place. Furthermore, the previous good practice of the city of Kalamata, in Southern Greece, in preserving cultural heritage after the earthquake disaster of 1986, about ten years earlier, was communicated to the Mayor of Konitsa via informal networking among Mayors. In the heart of the emergency, the attitude of the Municipality shifted towards preserving the identity and the vernacular character of the city and with it the stance of the population.
As a result, Konitsa preserved its vernacular and historic identity which together with its rich natural resources has now become a tourism asset.

(Dandoulaki 2010)

Figure 2.1.3. Damaged building in Konitsa (source: EPPO, http://www.oasp.gr/node/410)

some commonalities in observed positive cases, though. In societies and areas with disaster experience, the knowledge that the disaster is not the end but a phase, assists in maintaining a long term view. In such cases, the city and the society realise more that they will have a future and that the foundations of this future lay in post-disaster decisions. If there is no local disaster experience, consultancy and know-how by trusted knowledgeable external agencies can be very helpful (see the example of Konitsa, Greece). What counts more, though, is the attitude of the devastated society towards culture and cultural heritage, history and continuity. Perception of cultural heritage and its value is different in different societies, so is the meaning of preservation of cultural heritage (Heritage Council of Victoria, 2014. HLF, 2015).

Activities for saving historic and vernacular buildings, groups of buildings, neighbourhoods and settlements cannot be postponed for long, beyond the emergency phase or some elements to be preserved will be ruined or even demolished in the chaos and panic of post-disaster situation. During the emergency phase (typically the first 72 hours after the disaster) cultural heritage is under a range of new risks such as (UNESCO 2010, p. 41):

- Theft of fragments or movable objects of the property.
- In case of flooding, contamination through pollution and mould growth.
- Risks arising from the surrounding environment or habitat.
- Insensitive actions by relief agencies or by volunteers due to lack of awareness; for example pulling down damaged structures or causing damage from water used for extinguishing fires.

Figure 2.1.4 Upper Konitsa today.

2.1.5. Konitsa today (source: Konitsa Municipality, http://www.konitsa.gr/visit/villages/43-konitsa)

- Risks by inappropriate damage assessment of heritage.
- Confusion and delays due to lack of coordination and preparedness.

Salvation and preservation of cultural heritage should therefore start as early as possible after the disaster.

Emergency intervention measures of technical and non-technical character should be taken promptly. Technical measures include special damage assessments, documentation of the building and its condition (photos, drawings, reports etc.), emergency propping, removal and safe storage of significant elements of the building, emergency repairs. Non-technical measures refer to emergency planning concerning cultural heritage salvation, the deployment of special emergency response teams with clear roles and responsibilities for each member and equipped with safety equipment and appropriate material resources. It is also essential to have built complementary pre-disaster capacity and to have initiated educational and communication actions. No matter how well prepared, it should be expected that existing planning, preparedness, as well as knowledge and knowhow will be challenged by unexpected post-disaster circumstances.

At any case, pre-disaster awareness of the significance of cultural heritage pays off during the pressing emergency phase and also, having in place a strategy for the preservation of cultural heritage including institutions and legislation, as well as inventories and documentation of historic buildings and their contents. Furthermore, it would be greatly advantageous to already have a disaster governance structure in place that integrates the cultural heritage community.

2.2. The role of memories of disaster

Authors: Helena de Jong, Anne van Tilborg

Remembering hazardous events has important value to communities. Memories of previous disasters not only inform people's knowledge of their environment and vulnerability, it also influences their interpretation of risk and their response to future disaster. Memories of disaster may be expressed in public life in different forms, ranging from memorial plaques to myths. Over time, these manifestations of memory of disaster provide communities with the knowledge, practices and techniques to survive in a particular environment, and enable them to make sense of a disaster in recovery phase.

Memories play an important role in determining the way people respond to disaster risk, engage in disaster management practices and accept disaster relief in an emergency situation. It is therefore vital that response agencies become aware of, and accept the different logics and rationalities that people rely on when faced with disaster.

A valuable concept in this regard is 'cultural memory'. Cultural memory ensures that meanings and interpretations of disasters are recorded and handed down from generation to generation. It provides a means by which following generations can understand, contextualize, prepare for, and recover from catastrophes.
But wat is cultural memory? When does memory become 'cultural'?

2.2.1. What is cultural memory?

When does memory become 'cultural'? To answer this question it is helpful to make a distinction between collective memory, sometimes also referred to as social short-term memory, and cultural memory, also known as social long-term memory. Collective memory is based on oral tradition, shared by the group, often the family, and tends to disappear with the death of the last eyewitness of the event. Cultural memory goes further back and is understood as a social long-term memory based (at least in part) on written and material sources (Pfister et al., 2010). By contrast, cultural memory needs to be underpinned with documents such as newspapers, archives, pictures, and monuments (Pfister, 2011). Besides texts, images and rituals, Assmann argues that cultural memory may also exist in the form of narratives, songs, dances, rituals, masks, and symbols. For cultural memory to materialize, communities need to come together on certain occasions, for instance

through a joint celebration (Assmann, 2008 p. 109-118). Thus, whereas collective memory fades with the death of the last eyewitness, cultural memory lasts for generations.

Cultural memory is not about how the past is scientifically investigated, but refers to how we remember the past, and how we (re-)interpret certain events. This explains why it is called memory and not knowledge about the past (Assmann, 2008). Moreover, processes of remembering are selective, and subject to emotions, moralities, politics and historical -many times unequal- social relations (Ullberg, 2014 p. 3). In brief, cultural memory of disaster encompasses how "catastrophic events" are absorbed into history (Alexander, 2000). It reveals how communities adapt their cultural reservoirs over time in light of disastrous events.

2.2.2. Manifestations of cultural memory

Cultural memory may be expressed in many different forms. It is manifested in practices and structures as diverse as storytelling, small talk, myths, official discourses, monuments, rituals, landmarks, and arts. A distinction can be made between tangible and intangible cultural memory.

Tangible cultural memory

Tangible cultural memory refers to the 'touchable' or visible forms of cultural memory. Memory of past disaster can for example be materialized through mnemonic tools such as museums, archives and memorials (Ullberg, 2014). This tangible form of cultural memory of

The Museum of the City of Volos (Greece) enhances cultural memory of historical events in the city's history, including the earthquake disasters of the 1950s. However, it is not within the museum's purposes to advance disaster risk awareness. EDUCEN makes an effort to bridge the gap between knowledge about the history and culture of the city, past disasters included, and triggering awareness and action towards disaster risk awareness and protection. Therefore, the project acted as mediator between the Museum of the City of Volos and the Earthquake Planning and Protection Organisation of Greece (EPPO).Moreover, EDUCEN pushed for the development of tools to advance visitors' disaster awareness and to inspire taking measures towards disaster protection at an individual, family and school level. EDUCEN, in agreement with the Museum and EPPO, opted for the development of tools specifically directed at teenagers who were considered as one of the most challenging group of visitors.

Figure 2.2.1. Cultural memory of the 1421 flood in Dordrecht, the Netherlands

disaster can also be found in Dordrecht, a city in the southwest of the Netherlands that experienced flooding disasters in 1421 and 1953. A clear example of tangible cultural memory of the 1421 flood can be found in the form of a monument in the city centre of Dordrecht. The monument is an inscription on the wall which states in Dutch:

''t land en water dat men hier ziet, Waren 72 parochien , na s' kronyks bediet; Geinundeert door 't water krachtig, In 't jaar 1421 waarachtig"

The text refers to the supposedly 72 villages that have been ruined by the water.

Cultural memory of the 1953 flood is also present in the city. At several locations high water marks can be found on walls of public and private buildings, which show how high the water got in 1953. Such marks serve as a way to remember and compare the frequency and severity of floods over time. Another noticeable form of tangible cultural memory are the 40 photos on street corners throughout the city that portray the same street just after the flooding of 1953.

Another well-known form of tangible cultural memory are memorials. Memorials in the public sphere are well suited to recall the memory of historical disastrous events. They serve as a place to call to mind what happened. Frequently, they also are a location where people gather in annual commemorative events. Memorials can take a variety of forms. The Katrina National Memorial Park for example commemorates the damage done to by hurricane Katrina to the city of New Orleans in 2005. The curving lines in the design of the park suggest the traditional spiral shape of a hurricane

Figure 2.2.2 One of the 40 photos portraying what Dordrecht looked like after the 1953 flood

Marks on public buildings are also frequently seen manifestation of tangible cultural memory on disaster. High water marks carved on the walls of public or private buildings for example present a typical form of cultural memory. They serve as a way to remember and compare the frequency and severity of floods over time. High water marks are for example visible in the wall of the "Gartenhaus" situated on the bank of the Tauber River in Southern Germany (Pfister, 2010 p.9). A total of 24 marks are visible on the wall, serving as a point of comparison for each subsequent flood.

Another form of cultural memory on disaster can be found in commemorative plaques which often serve as remembrance of what happened and the lives that were lost. These commemorative plaques sometimes also contain poems. Poems present another form in which cultural memory on disasters comes to the fore. An example of an expression of cultural memory in the form of poetry can be found below. It is documented for the flood of the Drac River in Grenoble in France, 1733. The poem was published two months after the event.

> *The ground vanishes, the mountains descend;*
> *Observably, brooks and rivers rise;*
> *Grenoble and its surroundings are below a real sea;*
> *Everything trembles, the cattle, the birds, and humans;*
> *Grenoble, you are lost. The monster swallows you.*
> *(Pfister, 2010 p.8)*

Moreover, tangible cultural memory can be manifested in books, paintings, and photos, news clips and movies. As present-day disasters are more easily recorded through modern communication tools and

Figure 2.2.3 The story of Beatrix de Rijke

social media, they are less prone to change over time (Erll, 2008). Media technologies and the circulation of media products nowadays play an important role in the transmission of cultural memory of disaster. Moreover, mass media construct narratives about disastrous events, thereby influencing how a disaster is remembered.

Intangible cultural memory

Intangible cultural memory refers to the less visible manifestations of cultural memory such as stories, myths, rituals and ceremonies, festive events and performing arts such as music and theatre. Telling stories is a well-known example of intangible cultural memory of disaster. There are many stories and myths that attempt to explain or come to terms with natural disasters. An example of how a narrative keeps the memories of the 1421 flood and its consequences alive can be found in the EDUCEN case study city of Dordrecht, the Netherlands.

In several Dutch museums, such as the Rijksmuseum in Amsterdam and the Hof van Nederland museum in Dordrecht, a story is told on a child named Beatrix de Rijke (Beatrix the lucky one) who survived the flood of 1421 in the Netherlands. The story goes that her cradle miraculously floated on the water because a cat kept the cradle in balance. When the crib washed ashore in Dordrecht, the municipality decided to take care of the costs of the orphan girl. The story of Bea-

Tangible forms of cultural memory	Non- tangible forms of cultural memory
Paintings	Stories/ oral traditions/ myths
Newspaper articles	Performing arts such as songs, dance, puppet shows, theatre
Photos	Traditions and rituals
Monuments and memorials	Social practices
Landmarks	Festive events
Libraries/ books	Commemorative events
Museums or exhibitions	
Archives	

Table 2.2.1. Overview of manifestations of cultural memory of disaster

trix was first published by the city historian Matthijs Balen in his 1677 Description of the City of Dordrecht. However, an image of the cradle with the cat can already be found as one of the details on a panorama of the flood by the Master of the St Elisabeth Panels, displayed at the Rijksmuseum in Amsterdam.

After a disaster, communities feel the need to make sense of what happened and search for answers- supernatural, religious, or scientific- to explain the event, Cashman and Cronin (2008) note. In an attempt to come to terms with a disastrous event, existing cosmological, ancestral, or scientific frameworks may be adapted and transformed into stories that offer myth-like explanations. The narratives often contain a merger of metaphors, heroic exploits, rumours and scientific explanations and commonly emphasize the event as the responsibility of a higher power, often a god, monster, giant, or ancestor (Cashman and Cronin, 2008).

Examples from Iceland and Japan illustrate how such narratives continue to play a role in modern communities.

In Iceland, the consequences of an volcanic eruption are kept alive through narratives, especially in rural communities, where heroic stories about narrow escapes and bravery during an eruption have been passed on to the younger generation (Johannesdottir and Gisladottir, 2010 p. 414). Research by Johannesdottir and Gisladottir on people's perceptions of Katla, a sub-glacial volcano in southern Iceland, found that several legends and myths exist. The respondents in their research repeatedly mentioned two legends, the legend of Krukkur and the legend of Katla. The legend of Krukkur is about prophet from the

middle ages, Krukkur, who had predicted that if the outburst flood of Katla had reached a certain place, the eruption of Katla would cease and change its starting place and erupt at sea. In 1918, the flood reached the specific place and in 1963 and 1973 two huge eruptions occurred at sea not far from Katla. Some residents then indicated that the predictions of Krukkur had proven valid and that Katla would not erupt again. In the legend of Katla, respondents refer to Katla as a female. This has its roots in a legend from the Middle Ages about a female who threw herself into a crater after a conflict with residents in the community. Soon after, there was an eruption which was seen as revenge of Katla. An eruption of Katla is seen as ''the return of Katla''. In the affected communities, ''strong oral traditions and storytelling serves as a constant reminder of the hazardous environment they live in'', Johannesdottir and Gisladottir (2010 p. 418) argue.

Another example of intangible cultural memory in this form can be found in the Japanese stories on earthquakes. According to a popular myth, the tremors of the earth are caused by restless catfish (or Namazu in Japanese) underneath the earth's surface (Bestor, 2013). Namazu is one of the yo-kai or ''monster'' creatures of Japanese mythology that have been seen as causing misfortune or disasters. Namazu are also found in printed form, on posters or pamphlets. The first known Namazu prints date from shortly after the Edo (modern Tokyo) earthquake of 1855. Nowadays, Namazu prints can also be found on earthquake safety posters (Reitherman, 2013).

Besides stories, folksongs commemorating disasters have a long tradition. The songs often share certain elements like recounting of the details of the event and the suffering of victims and survivors, and serve a common function in helping to heal society (Carr, 2004). Songs also illustrate the psychological impact of disastrous events, often illustrating the relationship between the hazard and the community (Cashman and Cronin, 2008).

Another example of intangible cultural memory are rituals and events like public commemorative silence. These (often national) commemorative events have become an important part of the history and identity of past and present communities throughout the world (Eyre, 2007). ''Event specific public activities such as memorials provide a communal forum for the outpouring of intense emotions, public recognition of the collective loss, and the reassurance that the group, while damaged, continues (Hawdon and Ryan, 2011 p.1368). Such rituals and events are often performed on disaster anniversaries and may for example include the laying of wreaths, lighting candles, or reading the

names of the diseased.

The following table provides a non-exhaustive list of different forms of tangible and intangible cultural memory of disaster.

2.2.3. Why is cultural memory important for communities?

Cultural memory of disaster, tangible and intangible, on disasters serves several purposes for communities.

First, cultural memory functions as a knowledge repository of historical experiences. Cultural memory in the form of a monument or oral traditions can provide communities with crucial information on, for example, precursory signs of the hazard, descriptions of the event –including specific vulnerable locations, directions, timing and duration, impact on the local population, and pre- and post-hazard changes in the landscape. It may furthermore provide information on community hazard mitigation, such as past areas of danger, safe areas, and evacuation routes. The research of Johannesdottir and Gisladottir (2010) on the villages of Alftaver and Vik, Iceland, for example revealed that most residents had first-hand knowledge on the outburst of volcano and the risk of a tsunami from former residents in the area. They acquired their knowledge from their ancestors who experienced outbursts in 1860, 1823 and 1918 (Johannesdottir and Gisladottir, 2010).

Specific knowledge on the presence of hazards has proven extremely valuable in the case of the 2004 earthquake and tsunami in the Indian Ocean where different ethnic groups of Aceh, Indonesia were hit unfairly: whereas about 170,000 Acehnese and Minangkabau people died, in the same region, only 44 Simeulue people passed away. The research shows that the Simeulue detected the tsunami very early due to their knowledge of the environment which enabled them to escape to the mountains. Research found that their knowledge on tsunamis is rooted in oral accounts of an event that occurred in 1907 killing between 400 and 1800 people. About 85% of the surveyed population said they were aware of this event, which they learned from their parents and grandparents. Its precursory signs such as sea withdrawal had been remembered and passed down from generation to generation. After the earthquake people went to check if the sea was withdrawing, spurring immediate evacuation. In this case, oral traditions on tsunamis documented the experience of past generations and pro-

vided a means through which following generations understood what was happening (Gaillard et al., 2008).

Second, cultural memory of disaster provides communities with interpretations and response plans (Schenk, 2015). This has important implications for the ways people explain an event and react to it. When remembered, memorialized and compared, experiences of disasters may for example inspire the invention of social practices and techniques in dealing with recurrent hazards. As stated by Engel et al. (2014), ''communities living in hazard-ridden or disaster-prone areas develop an array of coping mechanisms as well as more deeply embedded practices to deal with threats and opportunities their environments encompass (…)''. ''Experiencing recurrent disaster pushes communities to develop cultural strategies and practices to deal with these adverse events and ensure increasing levels of resilience''. Historical records and architecture have provided evidence of cultural adaptations to environmental threats (See also Bankoff, 2011).

Although Dordrecht was among the areas that narrowly escaped the destroying impact of the flood, several forms of cultural memory on the flood can be found in the city. Adaptation to physical hazards posed by the water has led to a range of coping mechanisms, including engineering solutions such as the well-known Delta Works. Moreover, the risk of flooding is seen in the adaptation of houses in risk-prone areas and the use of flood boards in the main street of the city. Examples of architectural adaptation can also be found in the parishes of Itteren and Borgharen in the south of the Netherlands. In Itteren, the majority of houses have built their first floors as high as, or higher than, the highest flood levels reached before the house was built (Velotti et al., 2011). This enables them to stay in their houses when the parish is flooded and keeps most of their private goods safe from the water (Engel et al., 2014). Memory thus has an instrumental value to communities as it spurs the development of problem-solving tools, serving as a community education tool, that over time proves to be valuable to surviving in a particular environment (see Schein 1999, p. 43, Engel et al., 2014).

Third, cultural memory on disasters provides people with an explanation. Psychological studies on the aftermath on disastrous events have shown that trauma can shake the foundations of a person's faith and generate a search for answers- may they be supernatural, religious, or scientific. An important component of community resilience to hazards is accepting the event. Such acceptance may be realized through the adaptation of existing cosmological, ancestral, or scientific frameworks, but may also be done through creative and artistic

expressions or myth-like explanations. Simple explanations, whether or not in the form of myths or superstitions, enable communities to make sense of the experience (Taylor, 1999). When such explanations are not available, psychological recovery from a disastrous event may be hindered. Besides the positive aspects of cultural memory it is important to note that the search for explanations can also misinform behaviour of communities or hinder mitigation measures of outsiders. Oral traditions, myths or other explanations for an event that are transmitted effectively may for example replace ''rational calculation'' in a community's response to disastrous events (Paine, 2002). Moreover, people may also use cultural and historical explanations to minimize fears and to live a normal life, increasing their vulnerability. Such explanations may very well differ from scientific explanations and if not well understood, hinder adequate disaster response of disaster risk managers as we will see below.

2.2.4. Why is cultural memory important for disaster managers?

The influence of cultural memory on people's knowledge, behaviour, and ability to find explanations and make sense of past disaster has important consequences for disaster risk management practice. For disaster managers this entails that communities sometimes might not respond the way them expect them to behave. As stated by Dash and Gladwin (2007 p.70) ''Although emergency managers and others assume that people will act rationally- hear a warning, realize the danger conveyed in that warning, and leave when told to do so (because the cost of staying outweighs the benefit)- more often than not, many of those at greatest risk choose not to take protective measures each time a warning is given.'' People's protective response to warnings is a consequence of the perceptions they have. Most of the time, people evacuate and take shelter only when they find themselves being in imminent danger and if they perceive that taking action is appropriate considering the threat (Mileti and Peek, 2000).

Risk perceptions often rely on intuitive risk judgements and beliefs rather than on rational deliberations, and therefore may considerably differ from risk assessments by experts. As Alexander argues ''decisions about whether to mitigate a natural hazard are often not a function of how dangerous the hazard is in absolute or objective terms but how dangerous it is perceived to be'' (2000 p.73). A frequently noted factor as shaping risk perception of natural hazards is previous

experience with, and memories of previous hazards. Cultural memory of disaster may thus influence risk perception. In the case of the Mulde river in Germany, no one seemed to have anticipated that the river could rise as high as it did in 2002. Most of the affected people had previous experience with floods but because they thought they understood the river and its variations, they could not envisage the 2002 flood (Kuhlicke et al., 2011). Memories and previous experience with hazards in the above cases led to inaccurate perceptions of risk. Such flawed perceptions could result in a lack of preparation and mitigation measures, and damage and victims that could have been prevented.

Cultural memory plays an important role in determining the way people respond to disaster risk, engage in disaster management practices and accept disaster relief in an emergency situation. Warning information and activities of disaster risk managers are processed through the social and cultural lenses of communities which are constructed by their particular cultural context, and amongst others, by their own experience, knowledge, and explanations of disaster. It is therefore vital that response agencies become aware of, and accept the different logics and rationalities that people rely on in the face of risk. The presence of monuments, museums, high-water marks, and stories and myths incorporated in collective long-term memory of communities may present important clues for community perceptions and behaviour to disaster risk managers.

Having disaster risk management informed by cultural memory and its potential impact may help to reduce misunderstandings and inefficiencies and improve communication and interaction between disaster managers and local communities.