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Communication crisis management during natural disasters: actors, processes and digital applications

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The case study of Nepal: implications and challenges derived from the use of new technologies

Introduction

This thesis has been conceived with the purpose of analyzing the importance of communication and coordination process in the management of humanitarian crises. To be more specific, I have primarily focused on humanitarian crises caused by natural disasters. The essay will also deal with all those new technologies and innovative tools that may be used for communication in times of crisis.

At the beginning of my research work, I soon realized that I needed to clarify a point. Why is communication so important in the management of humanitarian crises caused by natural disasters?

Quite naturally, disaster-stricken populations suffer a great deal and need prompt assistance. Let us consider recent disasters such as the earthquake in Haiti (Mary Beth Sheridan, 2010) or in Nepal (Bruce Kennedy, 2015), or calamities as famines or epidemics. Indeed, disasters affect in a most traumatic way both the society and the economy of a country, causing the loss of many lives. It is for this main reason that I have decided to study all the organisations that work in this field, and to investigate their strategies and means of communication. The latter feature is essential to intervene in the most efficient way possible in situations of crisis. Indeed, a good communication plan must be designed to solve and manage a crisis moment. However, it is also important to use proper communication technologies. Not only they allow the gradual improvement of the communication process, but they also contribute to prevent natural disasters and exert control on complex situations. Moreover, technologies have a significant role in the general coordination of activities. Since many different organizations intervene when a natural hazard occurs, it is necessary to coordinate the efforts, thus securing the positive outcome of the operations. However, such is a difficult task that requires specific skills and appropriate means.

Another feature of the communication process should be examined. Technologies can prove essential to a disaster-stricken population; such tendency is reported to be growing in importance, for, in many cases, technologies can save lives (OECD, n.d.). Yet, do people have the instruments

to approach technology and do they have enough knowledge, competences and skills to use them? Such is a significant point, for the areas most affected by natural disasters are developing countries. As a consequence, they are disadvantaged compared to other countries. For instance, if an earthquake occurs in Africa, it will have a given kind of consequences; if an earthquake occurs in America, it will have completely different effects. Such variation characterizes the way organisations intervene as well.
In conclusion, it is my intention to analyse the inner structure of communication and its main features, in order to apply them to the relation between organisations and disaster-stricken countries.

When I first approached the object of this essay, I realized that it was an extremely broad topic and that, as a consequence, I needed help from an experienced person to identify the key points of my research.
Thanks to Professor Padovani, I got in touch with Dr. Cristina Graziani, who has specialized in the management of humanitarian crises and has been working for Food and Agricultural Organisation (FAO) and other UN agencies for several years. She kindly provided me with a general overview of humanitarian crises and responses and offered me useful advice on materials and authors to help me begin my research. I soon started analyzing the documents that she had given me, then extending my search to web sources (e.g. organisations' official websites and reports). However, considering the great number of organisations that are commonly involved in rescue processes, I decided to focus only on I decided to analyze some of those who have more developed communication plans.
I selected United Nations International Children's Emergency Fund (UNICEF), for children and education; Food and Agricultural Organisation (FAO) and World Food Program (WFP) for food and nutrition. In my opinion, such organisations are the main actors of the rescue process, being involved in the most significant aspects of crisis management. Moreover, they are particularly adequate to the topic of my research, for they are reported to conceive and make use of highly-developed communication plans. That said, I will also consider the

Office for the Coordination of Humanitarian Affairs (OCHA). While the former coordinates the efforts of the other organisations and further provides an overview of how organisations work, the latter is the first actor to intervene during a humanitarian crisis.

My analysis is grounded in the study of reports written by humanitarian organisations. To examine what technologies can be effective in times of crisis, I decided to refer to the major agencies of the sector. As far as the study of technologies is concerned, I preferred to focus on ICTs, and, in particular, on telephone applications, seeking information on official websites only.

Then, in order to provide a clear picture of Nepal case study, I used both institutional sources and newspaper articles.

I have conceived the present research with the primary aim of providing an overview of the most adequate communication strategies and tools to be employed to manage a humanitarian crisis.

To be more specific, the research has been conducted with the purpose of:

- defining what a humanitarian crisis is and indentifying the main actors involved in rescue operations;
- depicting all communication processes involved and the agencies performing roles in such contexts;
- examining how new communication technologies be may employed in the different phases of crisis management (from prevention to reconstruction);
- identifying individuals/organizations who finance and design innovative communication tools;
- understanding what are the main problems and issues related to the use of new technologies in facing natural disasters;
- analyzing new trends in the application of communication technologies to civilian crisis management.

In the essay, I will focus on and examine two different dimensions of emergency situations:

- Communication processes during rescue operations: in particular, the coordination process between operators and other actors, in the context of a humanitarian crisis;

- Communication technologies, instruments and tools used by organizations to communicate with the local communities (and vice versa), providing information and useful suggestions.

This work is structured as follows:

a first chapter deals with the intervention process at large, and with the type of communication used by the various actors involved in a crisis. It will also point out the correct timing and modalities to provide successful help and assistance. To be more specific, in the chapter I will try to answer and explain matters as such:

- What is a humanitarian emergency?
- Who are the main actors involved?
- What are the main phases of the intervention process?
- What role does communication play in such context?

Moreover, in the chapter I will provide a further distinction between two different types of communication that characterize the general management of a crisis. One is internal communication, which consists in the information-exchanging process between people of different levels or within an organisation. (The business communication, n.d.). The other is external communication which, instead, occurs between a given organization and other organizations, groups or individuals outside its formal structure (The business communication, n.d.). Finally, in the ending part of the first chapter I will analyse all the communication tools used by organizations to understand how they relate with those involved in humanitarian emergencies.

The second chapter provides an analysis of the ICTs used to manage operations before, during and after a crisis. It will depict those digital technologies used in communication during a humanitarian crisis, explaining how they can facilitate information exchange. It will also deal with the private sector's main role to provide information technology, thus coordinating efforts with organisations and, in particular, non-governmental agencies. Moreover, in the chapter I will make reference to the socio-cultural effects of technologies, and to all possible advantages and disadvantages of their use. It is to be said that results may vary,

for technology is not neutral; it may be either effective or not depending on the context in which it is employed.

Finally, in the third chapter I consider a specific case study, in order to identify and explain, in most practical terms, the positive and the negative effects of information technology in relation with a country's socio-cultural features. The event I have decided to analyse is the massive earthquake that hit Nepal on 25 April 2015. Here, I examine which communication tools have proven most effective in coordinating efforts and what kind of impact they may have on a country's population and society.
To do this I have consulted the report of the major agencies that dealt with the rescue and institutional documents. The chapter will end with a reflection on future trends in the use of new technologies, to better comprehend how we could spread them and make them more effective in situations of crisis.

This work provides an overview of the complex relation between communication and humanitarian crisis management. The focus on technology should find explication in the worldwide usage of new tools and devices, especially in the communication process. They have many advantages, of course, but disadvantages as well, if not used properly. However, if technology is correctly employed in the management of humanitarian crises, it can save lives. It is for such reason that it is important to create solutions, so that everyone can benefit from its potential. This research aims to be a stimulus to create greater awareness on the use of such innovative devices. Indeed, unfortunately, the inner potential of new modes of communication is still poorly dealt with.

Crisis management: communication challenges and actors involved in humanitarian emergencies

The purpose of this chapter is to outline the context in which humanitarian interventions are activated in case of natural disaster. The agencies, the actors who are involved and coordination processes to meet the emergency. The focus of this chapter is to analyse two different aspects of the standard communication procedure during emergency cases. The first aspect concerns "internal communication"; it consists in the various ways organisations communicate with each other and prepare for the first phases of their intervention. This first part examines the procedures used in the field of emergency management looking with particular attention to the role played by communication in this area. The main sources used in this first part are the reports and regulations produced by organizations that deal with the management of humanitarian crises. This part is extremely technical, for it is characterized by a series of precise rules. The focus of this first part is on the definition of humanitarian emergency and the criteria for defining it, the analysis of the actors involved and their functions and the analysis of the intervention and coordination processes in these cases.

The second part of the procedure, instead, deals with "external communication", that is, communication addressed to other actors involved during crisis such as media, donors, volunteers, civil society and other audiences. This part is devoted to the analysis of some organizations and their communication strategies that they put in place to deal with the other actors involved in the emergency management process. It includes the most significant tools used by organisations to communicate, how they are acting and what solutions they will bring during the rescue process.

1. How can we identify a disaster? Who takes action when a natural disaster occurs? What are the correct procedures to be followed?

At this stage of the chapter the focus is on the description of the procedures that occur when a state of emergency is declared. The focus is on the internal communication: on all the procedures, the interventions and the coordination

processes of actors involved in rescue work. The focus is especially on United Nations agencies because they have a crucial role in this field. This part of the essay analyses how agencies communicate and how they work during emergencies.

The analysis of internal communication between agencies is critical to understand what role communication plays in coordinating relief works. Indeed, communication is becoming increasingly important in the context of crisis management during natural disasters. Natural hazards are becoming everyday more frequent. Organizations involved are many and coordination is very complex.

In recent years there have been frequent cases of natural disasters that caused considerable damage (floods, hurricanes, earthquakes, typhoon, etc.). To give some examples: the tsunami in Sumatra (2004), the Hurricane Katrina (2005), the earthquake in Pakistan (2005), the earthquake in Haiti (2010) and the earthquake in Nepal (2015). To cope with this reality, the international community has adopted over time new tools to deal with these situations. Indeed, there are many different organisations, governmental, non-governmental and intergovernmental, whose duty is to take action when a natural disaster occurs. There are different actors involved in relief work, for convenience we can divide them into: United Nation agencies, inter-governmental organizations, non-governmental organisations, government and institutions and private sector

In my essay the focus is primarily on inter-governmental organizations (IGOs), those are part of the United Nations system. The main reason why I focus on these organizations it is because, as we will see, they play a key role in the management of natural disasters. The United Nations system has a complex structure and network of organizations that work to respond to emergencies. It should be remembered however that these agencies work and collaborate with all other actors involved in the relief effort. To better understand their function we can begin by introducing this question: what happens when there is a natural disaster? When a natural disaster occurs first actors that are activated are governments and affected country institutions.

Indeed in the face of a natural disaster it is the government's duty to declare a state of emergency. This step is important because only after the government declared a state of emergency the UN agencies can intervene.

The second question is: what happens when a state of emergency is declared? Let's see what is the procedure.

When a government declares the state of emergency, due to a catastrophic event, the first organization that intervenes is Inter-Agency Standing Committee (IASC)[1], a UN agency created in June 1992, to give humanitarian response during disasters or conflicts.

To better understand in what occasions IASC intervenes we may need to clarify the concept of "humanitarian emergency". According to the Inter-Agency Standing Committee (IASC) Transformative Agenda[2], to identify the extent of a natural disaster a system has be defined. It consists in three disaster levels, classified according to the seriousness of the situation. The degree of severity of a natural phenomenon is placed in a scale of three levels we know we are facing an actual humanitarian crisis when the "Level 3/L3' emergencies" is reached. To give an idea of what it means emergency L3 level we can refer to some examples such as the earthquake in Haiti in 2010, Hayian the typhoon that hit the Philippines in 2013 and the earthquake in Nepal in 2015.

The five criteria used to measure and classify emergency situations are to be found in terms of:

- **Scale** (either size of affected areas, number of affected/potentially affected, number of countries affected);
- **Urgency** (importance of population displacement, intensity of armed conflict, crude mortality rates)
- **Complexity** (multi-layered emergency, multiple affected countries, presence of a multitude of actors, lack of humanitarian access, high security risks to staff, etc.);
- **Capacity** (low national response capacity, weak/fragile state, needs outweigh the capacity of Country Office (CO) and Regional Office (RO) to respond).

[1] https://interagencystandingcommittee.org/

[2] IASC Transformative Agenda is a program designed to improve the effectiveness of humanitarian response made in collaboration with Emergency Relief Coordinator.

- **Reputational Risk** (media and public attention and visibility, expectations on the humanitarian system by donors, the public, national stakeholders and partners). (IASC; 2012: p.6)

For the state of emergency to be confirmed, the phenomenon has to be classified through the above-mentioned five criteria. Since then it has remained active, though only in particular circumstances, that is, in case of a L3 emergency. In its initial phase, the intervention cannot last more than three months. Afterwards, IASC forces offer their support for a variable amount of time, to help people rebuild and re-establish a balanced situation, always respecting local authorities. But how does the process begin? What are the organisations involved?

Let's see how it articulates the rescue process with the help of the following diagram (Figure 1):

The operation is divided into three levels: international, national and local level.

At the global level there are the General Assembly[3] (GA) of UN and the Economic and Social Council[4] (ECOSOC).

[3] General Assembly (GA) is a policymaking and representative organ of the United Nations that provides a unique forum for multilateral discussion of the full spectrum of international issues. It plays a fundamental role in the standard-setting process and in the codification of international law.

[4] Economic and Social Council (ECOSOC) is the heart of UN system and it is responsible to the advance of economic social and environmental development. It is the platform from which develops any action at an international level as in the case of humanitarian crises

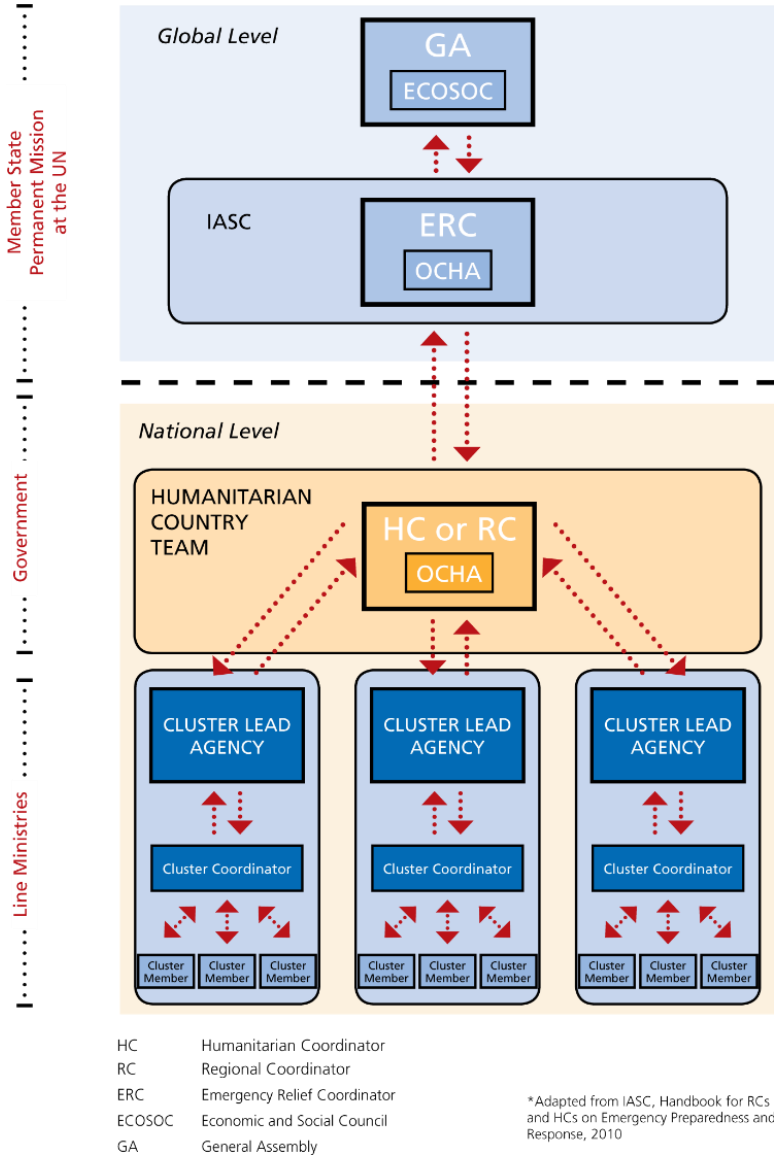


Figure 1. Organization of the actors involved in humanitarian crisis management

As soon as possible, that is, within 18 hours from the event, the Emergency Relief Coordinator[5] (ERC) receives an initial assessment of the situation, that is, the first information about the people affected by the disaster.

This assessment will be then completed by the Office for the Coordination of Humanitarian Affairs (OCHA) in the second phase of the intervention. OCHA is part of the UN secretariat, and its first role is to coordinate all the humanitarian organisations involved (OCHA, n.d.). Moreover, the OCHA is in charge of

[5] Emergency Relief Coordinator (ERC) "is responsible for the oversight of all emergencies requiring United Nations humanitarian assistance. He also acts as the central focal point for governmental, intergovernmental and non-governmental relief activities" (OCHA, n.d.)

coordinating the efforts on a local, regional and national level. However, every help procedure requires further support by special groups, known as clusters. Cluster are groups of organisations specialised on a particular field of action. When the various clusters arrive in a damaged area, they first evaluate the current situation and then plan a preliminary output, known as Multi-Cluster Initial Rapid Assessment (MIRA).

In this phase every cluster is fundamental, for dividing the work in terms of different competences often makes a prompt intervention possible.

The intervention process consists in the here-listed series of detailed procedures and phases.

- ***Assessing the situation***

This initial assessment phase mainly consists in defining the actual seriousness of a situation. When a natural disaster occurs, the ERC is promptly given all the information about the number of people affected by the emergency. The intervention process must be extremely rapid (within 18 hours from the event). Basing on the first available data, the IASC then releases a report. The main features and factors to be taken into consideration include:

- Secondary sources as media, situational data taken by the web, etc.
- Humanitarian Country Team's initial report, where possible. Whether the Humanitarian Coordinator[6] (HC) is not yet active on the area, the Humanitarian Country Team[7] (HCT) is responsible for writing and sending the report to the Regional Coordinator (RC). If circumstances require a prompt intervention, the input can be oral.

[6] Humanitarian Coordinator (HC) / Regional Coordinator (RC) is the "responsible for leading and coordinating the efforts of humanitarian organizations (both UN and non-UN) with a view to ensuring that they are principled, timely, effective and efficient, and contribute to longer-term recovery" (OCHA, n.d.)

[7] Humanitarian Country Team (HCT) "is a strategic and operational decision-making and oversight forum established and led by the HC. Composition includes representatives from the UN, International Organization for Migration IOM, international NGOs, the Red Cross/Red Crescent Movement. Agencies that are also designated Cluster leads should represent the Clusters as well as their respective organizations. The HCT is responsible for agreeing on common strategic issues related to humanitarian action" (Humanitarian Response, n.d.)

- Humanitarian needs and safety factor; general economic and political context; ability to react shown by the national authorities and communities; population displacements; access constraints; people's opinions and thoughts, in order to convince them to accept the current situation.
- If necessary, OCHA can undertake consultations with the National Disaster Management Agency and/or other national sources.
- Consultations with IASC partners, to assess the situation at the organisation's headquarter.
- In case of similar past events, ISAC can review the pre-existing contingency plans (IASC, n.d.).

- Consultations and decision making

During or short after a natural disaster, promptness of decision does make a difference. Indeed, the first phase of the intervention process is crucial, determining its final success or failure. For the intervention to be effective, there are four main steps to respect and take.

a. In case of natural disaster, the ERC must first contact the highest national authorities of the stricken area, in order to be authorized to intervene. Without an authorization, the rescue project cannot start. This is a particularly relevant point, for it clearly shows how paying respect to the local population can positively affect these delicate phase, from an administrative point of view as well. Indeed, cooperating with the local authorities can truly implement the whole procedure.
b. Provided that an authorization has been given, the inter-agency emergency network can be activated. Consequently, the highest intervention authorities meet to assess the situation, taking into consideration features such as the stricken country's general condition and resources, and all the measures taken in the past during similar situations. In this phase, the organisation set its priorities and start to create a plan, following the IASC Principles[8] (IASC, n.d.).

   Though all organisations base their intervention on a standard procedure, they give shape to their ultimate decision-making plan depending on the country and the situation.

[8] https://interagencystandingcommittee.org/principals

c. After receiving the Emergency Directors' proposals (within 48 hours from the disaster), the organization members meet to discuss and bring their plan to completion. Although discussion is allowed in this phase, the final decision is usually made by the ERC.

   During the meeting, various issues were been analysed. They decide the leadership model that would be more appropriate to adopt, depending on the specific case. It is to be specified that decision-making is here regulated by a list of rules conceived by the OCHA in order to facilitate the whole process and regulate the distribution of resources. They further choose the staff for the IARMM (Inter-Agency Rapid Response Mechanism), that is, a group of human resources sent on the territory depending on the situation of the stricken country. Moreover, they identify which intervention modalities and strategies should be applied and how much time should the operations last (usually no more than three months). They also choose the most appropriate project to be realized on the territory, when the organisations have left. Finally, they decide which communication strategies and humanitarian priorities would be more effective in the specific context of the stricken country.

d. In the last phase of the procedure, other organisations are informed of the project's activation, such as the UN General-Secretary (GS), the UN Department (Department of Peace-Keeping Operations or Department of Political Affairs as applicable), and the chair of the UN Development Group (UNDG).

- ***Activation***

Within 48 hours from the disaster, the ERC makes a final decision and communicates the details of the intervention to the IASC, via email. The ERC also explains to the local authorities what kind of intervention will be launched and what consequences it made lead to. Every decision is discussed by IASC Principles. During the activation phase, communication is a key factor, because coordinators have to communicate every decision to all the organisations members. Moreover, the ERC must inform the IASC on all the initiatives they have planned. Quite consequently, it may be worth noticing how crucial coordination is in this phase, especially if it includes discussing and debating.

- ***Deactivation***

As previously stated, the intervention cannot last longer than three months. However, when the organisations are about to leave the territory, they first prepare a long-term exit plan, thus helping the people from the distance. The exit strategy must be projected within a three-weeks' time from the beginning of the intervention.

In this phase, organizations decide on leadership matters, that is, if the old leadership must either be kept or changed. They further discuss about the organisation, the distribution and the coordination of functions during and after the intervention. At the end of the intervention, they also deal with possible action lines and common views, and then decide who should be given certain roles and responsibility positions. The main aim of such procedures is, of course, for operators to ensure the continuity of their work on the area.

A major factor of success, in such situations, may be surely found a coordinated and rapid kind of management. However, creating standards is equally significant in these cases. Standards should not be attainted to only when identifying a situation and its priority, but also when defining what the most adequate communication modes are. Quite consequently, standards are crucial, for they contribute to make the whole intervention more efficient and effective. It is for this very reason also that, in my opinion, the field of innovative technologies is rich and essential. Not only do modern electronic devices support the creation of new standards; they utter facilitate the information-exchange process between people of different regions or countries, allowing them to work together.

2. The humanitarian programme cycle

The Humanitarian Programme Cycle (HPC)[9] is a major point of the Transformative Agenda (TA). From its creation, its main purpose has been to oversee the development of guidance in coordination, leadership and accountability. The program started in 2011, after the crisis experiences in Pakistan (2005) and Haiti (2010). (IASC; 2013)

[9] https://interagencystandingcommittee.org/system/files/hpc_reference_module_2015_final_.pdf

Unlike the previously-dealt-with emergency plan, the HPC is to be applied in all kinds of crisis situations, not only in case of natural disasters. Indeed, the utter adaptability of the HPC allows to create a standard in several situations, during which organisations must face different problems and work with different actors. The program, moreover, plays a capital role in coordinating relations between the organisations involved, the local governments and the people affected by the disaster. It is for such reasons that the Humanitarian Programme Cycle is widely considered to be an effective communication and coordination model. It proves the importance of creating standards in communication, and enables the operators to do a more efficient job without wasting time.

The HPC has been conceived to meet many different objectives:

- To prepare the people for a disaster, if possible. The prevention factor is extremely important, for it enables both to save lives during natural disasters and to prepare the people for a possible one.
- To create a plan basing on the actual reality and condition of the stricken country. Organisations must indeed perform a situation analysis before and during the intervention.
- To set priority objectives early, and ensure they drive the response.
- To develop the decision-making process directly on the field, and create an action plan as close as possible to the habits of the affected population. In such moments, the role of culture is necessary to understand what the population actually needs.
- To monitor the impact of the humanitarian action and adjust programs in response. (IASC; 2013: p.3)

All these aspects clearly show how comparing the state of the current procedure with the future plan is crucial. It must be done in every step of the process, for it is only following such method that it may be possible to measure the final results of the work and to further understand what has yet to be done.

The Humanitarian plan is conceived as:

> “The HPC is innovative because it combines the above elements in a single strategic process that runs through the cycle of inter-agency

> coordination. Via the HPC, organisations working at all levels can help to define the overall shape of the response, position their role in relation to other organisations and programmes, and understand what needs to be done at a given moment. The HPC's structured and inclusive process has the potential to make international contributions to emergency response more coherent, effective, and accountable. Dynamic but structured decision-making is vital in the fast-moving and confused environment of an emergency. The HPC establishes a transparent decision-making process and timeline that enable organisations to know what to do when.
> At the same time, the HPC process is inclusive. It involves all relevant actors in decisions, and adopts a cooperative approach to achieving agreed objectives. 'All actors' includes humanitarian organisations, who play a critical role, as well as national authorities and affected people." (IASC; 2013: p.4)

As reported by the IASC, the distinctive trait of such emergency plan consists in its potential to involve both organisations and the people affected by the disaster. People of the stricken area are indeed the most important actors of the situation. Another major feature of the plan may be found in its accurate monitoring action, which enables to implement the work process both during and after a crisis. Furthermore, the IASC bases its whole plan on values such as inclusion, and supports a policy of consultation. The latter is particularly relevant, for it eventually leads the achievement of common objectives and, consequently, to higher results. It is for this main reason that the IASC focuses its attention on the relations between international and local actors.

The basic structure of the intervention process is very complex, as it may be noticed in the chart below. It depicts the IASC intervention model and the coordinated action of organisations and clusters during an emergency. As previously stated, the process consists in several phases. What I will now deal with, however, in a more detailed way, is what exactly happens after the state of emergency is declared and what are the main stages of the process. The chart

can indeed give us the measure of the plan's complexity, and yet send a further message as well. It displays the structure of a thoroughly organised process, characterized by inner connecting forces. Here, every action is but the consequence of a previous action. According to the "Reference Module for the implementation of Humanitarian Programme Cycle"[10], these are the principle phases of crisis management that are illustrated also below in the diagram that illustrates the process in a detail way.

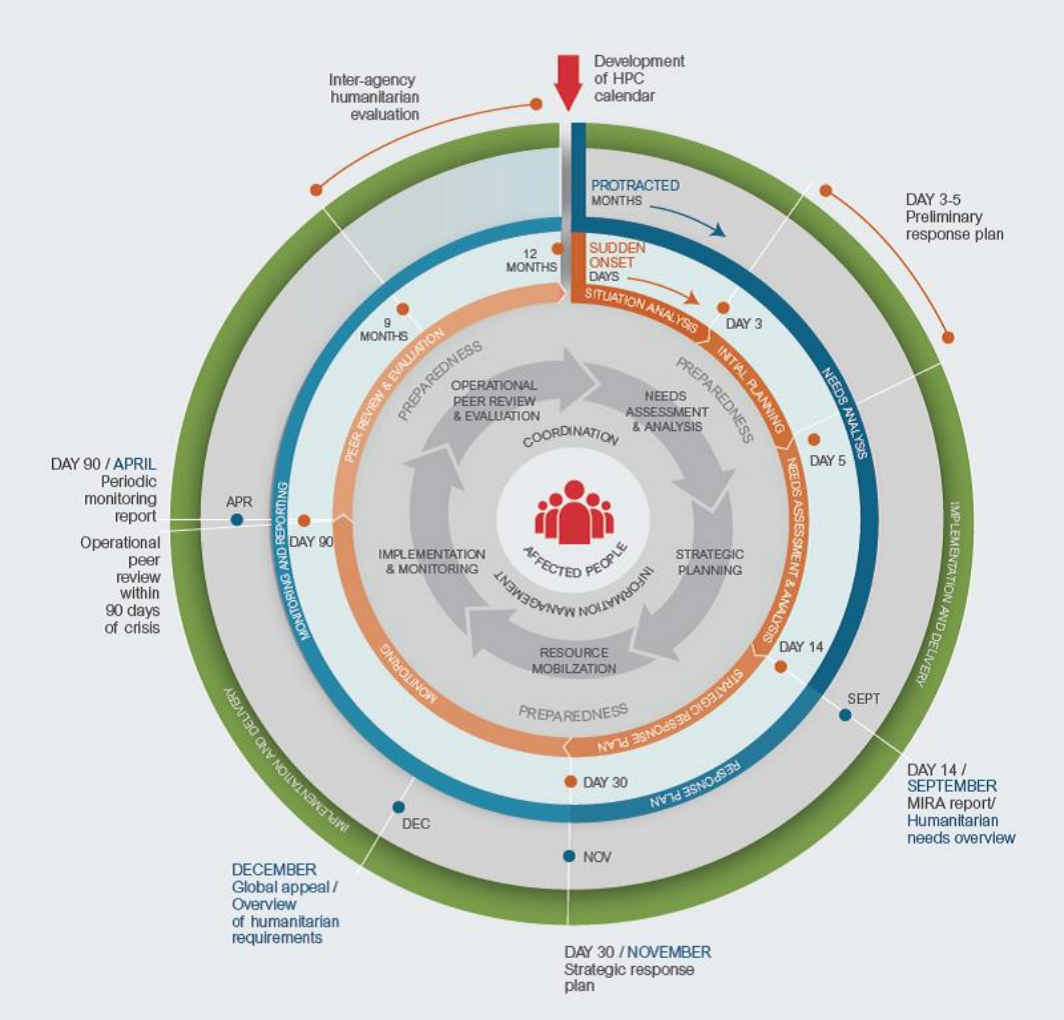


Figure 2 .Visualisation of the Humanitarian Programme Cycle

[10] https://interagencystandingcommittee.org/system/files/hpc_reference_module_2015_final_.pdf

- ***Preparedness***

The Preparedness phase should take place prior to the disaster. Indeed, it consists on the study of the specific situation and includes a series of simulations to be performed before the disaster occurs. The main aim of the simulating process is, of course, preparing for the real disaster to happen.

As far as the ERP (Emergency Response Preparedness) phase is concerned, it may be interesting to analyse five key elements that are necessary in the whole crisis-management process:

- Risk Profiling: analysis of the risks and of the population's potential vulnerability; understands people's needs after the disaster has occurred.

- Early Warning Monitoring: accurate monitoring of the most vulnerable countries, in order to draft a Contingency Response Plan.

- Minimum Preparedness Action (MPA): assessment of the most urgent procedures to be started during a crisis situation. Several kinds of simulation are performed in this phase. The variety of procedures concerns the following aspects:

• Coordination
• Assessment
• Response Planning
• Resource Mobilization and Monitoring
• Information Management
• Reporting, Public Information and Crisis Communication
• Capacity Building/Training. (IASC; 2015: p.16)

- Contingency Response Planning (CRP): plan conceived to bring organisations to a good level of preparation in case of disaster. It provides the operators with resources such as a situation analysis, a strategic statement and a preliminary response plan. The CRP must further allow an advanced preparedness action, to get prepared in case of crises.

- Standard Operating Procedures (SOPs) for the Initial Emergency Response: initial phase of coordination in a crisis situation, involving an accurate distribution of roles and responsibilities. In this part of the work people must be extremely quick in organizing and coordinating the staff and the operators.

It is important to know the context in which organizations act, define who intervenes and what roles plays. These actions are decisive to determine the functions of each actor in the process of communication. The definition of these roles makes it more fluid and rapid the coordination of the process by increasing the effectiveness of intervention in the event that it were necessary.

- ***Situation analysis***

The Situation Analysis is usually provided two days after a large-scale emergency has occurred; it must indeed properly present the initial stage of the crisis. Basing on the information gathered during the preparedness phase, operators must formulate an action plan for the first 30 days of the emergency. The most important information must here concern the general severity of the situation, the conditions of the population, the local organisations and the national authorities involved etc. (IASC; 2015: p.16)

In this phase, it is also essential to conduct a preliminary analysis on the population's specific needs and on the scale and scope of the emergency. Furthermore, experts must provide an exact description of the context and a complete evaluation of the people's capacity to respond, both on a national and on a local level. Thus, it will be possible to understand which aspects of the intervention must improved, and reason on the possible evolution of the emergency.

In this phase of the communication process it is crucial for several reasons: it is the phase in which the retrieval of information is necessary and must take place in a short time. Operators have to deal with the locals and must interface with people of different cultures that have just been subjected to a traumatic event. It requires a certain delicacy at this stage, but it is also necessary a certain speed so it is essential to have a good relationship and communication talents.

- ***Strategic statement***

The Strategic Statement is presented three days after the emergency has started. It is the first official document to be released by the HCT and the HC and its main purpose is to properly explain the situation. For such document to be written,

operators must first meet, discuss and then summarise the situation to the local authorities. They must also explain the scope of the emergency, analyse the humanitarian context and take into consideration what kinds of operations are essential to guarantee the success and the effectiveness of the intervention.
This phase is fundamental not only to describe the exact state of things, but to point out what needs or not to be done to help the people affected by the emergency. In this step the comparison is crucial, this phase collects all the information needed to define the situation and lay the foundation for a long-term intervention. All subsequent steps depend on the exchange of information of the operators and the exchange of opinions about the best methods of intervention.

- ***Preliminary response plan***

The Preliminary Response Plan is presented five/seven days after the beginning of the emergency. (IASC; 2013: p.19)
As a matter of fact, the Strategic Statement is the operators' primary information source. However, it is when such document is first drafted that the actual emergency plan starts. It may be defined as the first step of the decision-making process, focusing both on the inter-cluster and on inter-organisations activities. It further regulates the Strategic Response Plan. The plan's most relevant purposes include: enabling operators to gather news and information on the intervention area; coordinating the efforts; estimating the total cost of the intervention.
Many different strategies and specific operations are conceived and carried on in this phase. According to the Humanitarian Programme Cycle report, they include:

- A list of general objectives, drafted in cross-sectoral language, that indicate how protection vulnerabilities and concerns will be addressed.
- The scope of the emergency (displaced persons, needs, geographic area, budget needs etc.).
- How the international response will support and successfully relate with the government’s actions.

- The coordination of efforts and responses, showing how organizations, agencies and donors can cooperate with national authorities to achieve the intervention's main aims.
- Lacks and gaps in coverage or capacity that need to be filled.
- A first evaluation of objectives and priorities on a sector, cluster and inter-cluster level. It consists in an initial analysis of the most urgent procedures to be started, and on the work division among clusters, basing on their area of competence.
- A first estimation of the total cost of the intervention. (IASC; 2013: p.19)

Here, too, it plays a vital role communication and dialogue between operators with different knowledges that can get to confrontation and work together for a better operation result. Communicating at this stage means to field all the skills, knowledges and experiences previously made to foster a better job.

As it has been examined in this part of the essay, the intervention process consists on various phases and steps. Every step provides an evaluation on what part of the process has been already done, what needs to be modified and what must be done yet.

It has to be pointed out that the on-going debate on the major potential action-lines is essential to create a more efficient work process and cooperation between the actors involved.

3. Coordination among clusters

Clusters are groups of humanitarian organizations, UN and non-UN organizations, specialized in different fields involving the emergency processes, from the health sector to the education. Every sector is composed from different actors. They create partnership with local authorities and civil society and they provide help to afflicted communities. As we know coordination is often reported as a most important part of the intervention process. Indeed, though actors of different kind work during an emergency, and each of them has different objectives and competences, there must be perpetual interdependence and coordination (Humanitarian Response, n.d.).

Generally speaking, each cluster is charged with a different task. They are nominated by the IASC and are mainly responsible for coordination. The cluster approach was used for the first time in Pakistan, after the 2005 earthquake. In this occasion, nine clusters were established in the first 24 hours. Afterwards, the experts evaluated the effectiveness of the cluster approach twice: in 2007 and in 2010.

According to the "Reference Module for Cluster Coordination at Country Level"[11], the role of every cluster is to be found in its ability:

"To support service delivery by:

- Providing a platform that ensures service delivery is driven by the Humanitarian Response Plan and strategic priorities.
- Developing mechanisms to eliminate duplication of service delivery.
- To inform the HC/HCT's strategic decision-making by:
- Preparing needs assessments and analysis of gaps (across and within clusters, using information management tools as needed) to inform the setting of priorities.
- Identifying and finding solutions for (emerging) gaps, obstacles, duplication and cross-cutting issues.
- Formulating priorities on the base of analysis.

To plan and implement cluster strategies by:

- Developing sectoral plans, objectives and indicators that directly support realization of the overall response's strategic objectives.
- Applying and adhering to common standards and guidelines.
- Clarifying funding requirements, helping to set priorities, and agreeing cluster contributions to the HC's overall humanitarian funding proposals.

To monitor and evaluate performance by:

- Monitoring and reporting on activities and needs.
- Measuring progress against the cluster strategy and agreed results.
- Recommending corrective action where necessary.

To build national capacity in preparedness and contingency planning

[11] http://who.int/health-cluster/about/cluster-system/cluster-coordination-reference-module-2015.pdf?ua=1

To support robust advocacy by:

- Identifying concerns, and contributing key information and messages to HC and HCT messaging and action.
- Undertaking advocacy on behalf of the cluster, cluster members, and affected people."(IASC; 2015: p.13)

Among the eleven clusters currently active at a global level, I would like to analyse here the main role played by four of them: Camp Coordination/Management, Food Security, Emergency-Telecommunications and Education. Their uniqueness is to be found in the valuable contribution they bring in a crisis situation. Indeed, the fields overseen by these four clusters are the first to require an urgent action, during an emergency.

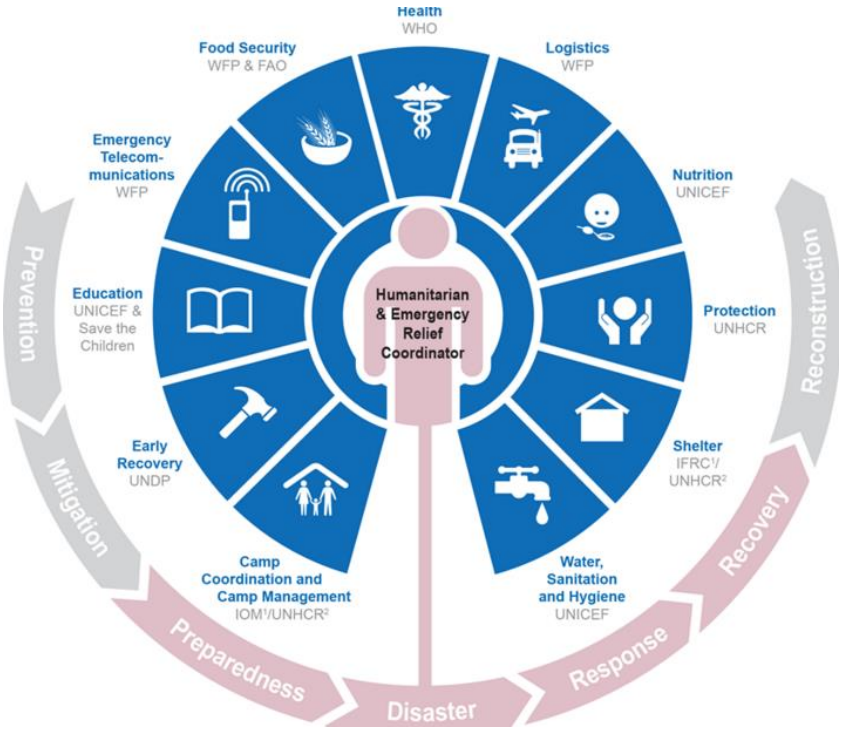


Figure 3. Representation of the clusters monitored by the Humanitarian and Emergency Relief coordinator

It is my opinion that some clusters, more than others, are particularly suitable to analyse, in order to identify the main factors and actors of an intervention. They can help us understand further details on the distribution of problems and on their possible solution. Moreover, they have a major role in the communication strategy and coordination process, enhancing efficient intra-cluster collaboration. I have

decided to provide a more thorough knowledge to the clusters that are more related to the main purpose of this essay, that is, to underline the role of technology in communication.
The most influential global clusters that I would like to explore here are:

- **Camp Coordination/Management Cluster(CCM)**

Its most valuable quality is to be found in its management of the intervention area. The cluster is composed by different partner agencies, such as the International Organization for Migration (IOM) and the United Nations High Commissioner for Refugees (UNHCR), which commonly work with the Global CCCM cluster[12] during the rebuilding phase (CCCM cluster, n.d.). The primary objective of this cluster is to improve the life conditions of the stricken country's population. However, the group is also charged with managing, in the best possible way, every type of camps: communal settlements, namely planned camps, collective centres, self-settled camps and reception or transit centres (CCCM cluster, n.d.). Finally, the cluster members are specialised in the administration, coordination and management field.

- **Emergency Telecommunication Cluster (ETC)**

As previously discussed, the relation between technology and communication is fundamental to properly coordinate the efforts[13]. The cluster, in collaboration with partners, has the main task of providing technologies and common communication services during humanitarian emergencies (ETC, n.d.). Indeed, the group's primary aims are making use of technology to improve coordination between different organisations, and providing a more efficient information access to create a safer environment for both the staff and the stricken population. Within 48 hours from the disaster, the cluster usually manages to provide technologic support to the other clusters, thus improving the intra-cluster communication.

[12] http://www.globalcccmcluster.org/
[13] https://www.etcluster.org

- **Food Security Cluster (FSC)**

The FSC[14] has a primary role in the intervention process, being involved in every single humanitarian emergency. Not only does it take action when a natural disaster (an earthquake, a hurricane etc.) occurs, but it offers valuable support in other cases, such as during an epidemic or a war. Food is indeed the most important resource for humanity in every situation. The group is composed, as other clusters are, by several different agencies, such as international NGOs, UN organisations, governments, donors and other cluster lead agencies (FSC, n.d.). Moreover, among the most influential organisations that work in this cluster we can find the FAO, the WFP, the Red Cross and the Red Crescent members. All these organizations coordinate their efforts to provide food to the people affected by a crisis.

- **Education Cluster**

Although such cluster is mainly composed by Save the Children and UNICEF, it includes many other organizations as well[15]. Their principal purpose is improving the educational system in countries stricken by a humanitarian crisis (Education Cluster, n.d.). Education is indeed necessary in problematic contexts, for it is the driving force that encourages a country to restart. Furthermore, it is to be reported that children are the weakest social category and, therefore, need special attention, especially in these situations. The cluster works using a coordinated approach with local education structures, to properly respond to the needs of the stricken country. Education influences culture, and as previously stated, culture enables to get aware of possible risks and face dangerous situations in a most safe way.

4. Internal communication and information management: the importance of communication process among actors involved in humanitarian aid

As previously analysed in the essay, communication is a key factor during an emergency, for it enables to give a prompt response to the people's main needs.

[14] http://foodsecuritycluster.net/
[15] http://educationcluster.net/

In particular, I would like to point out that internal communication is crucial for an intervention to be effective. Indeed, when the operators of a same organization manage to create an efficient communication circle, the whole intervention is more likely to succeed. Moreover, for organisations usually gather a great deal of information, including large dataset, communication must be as fast and clear as possible. It is for such reasons that organisations have designed a specific procedure to be used during natural calamities. This procedure can be found in the document entitled Operational guidance on Responsibilities of Cluster / sector leads and OCHA in Information Management[16].

When a natural disaster occurs and the OCHA takes action, the initial intervention context depicts a very complex structure. Different types of organizations here unite to work for the same goal, that is, helping the people affected by the disaster. For the teamwork to be productive, however, it is necessary to respect a series of rules. As we said organisations are divided in clusters; every cluster is charged with a specific task and deals with a single aspect of the humanitarian crisis. That said, even though each cluster has a specific role, coordination between different units is essential to solve the many problems caused by a crisis. Such intra-cluster communication process is also known as **Information Management**. This peculiar type of communication is organized in a series of rules that must be respected by all cluster members. The Information Management process belongs to the internal communication field, for it aims to regulate the bases of effective communication and to achieve excellent results. Let us further clarify this concept. Intra-cluster communication enables to exchange useful information and resources concerning the precise situation of the intervention area. Information Management includes every phase of such information-exchange process, starting from the production of information, to their spread to the other organizations involved. As a matter a fact, information too can be both internal (given by internal sources) and external (given by external sources).

[16]https://www.humanitarianresponse.info/system/files/documents/files/Operational_Guidance_on_Responsibilities_of_Sector_Cluster_Leads_and_OCHA_in_Information_Management_V3.0.pdf

Information Management is managed by the Cluster Lead Agency[17] and by the OCHA; such forces coordinate the whole intra-cluster communication. Basing on information, cluster members can indeed make decisions and coordinate the efforts not only within their own unit, but with the others as well. Hence, information could be defined as the first ingredient of an efficient decision-making process. To be precise, clusters must share their information and resources; if the latter are clearly structured, both communication and intervention will be a success. Such statement has been further confirmed the report "Operational Guidance on Responsibilities of Cluster Sector leads and OCHA in Information Management". It is clearly stated that every cluster is responsible for sharing information with the other clusters. (OCHA; 2008)

It is every cluster's duty to allocate human and financial resources to the Information Management; each unit has a IM focal point which must be communicated it to the others. Indeed, clusters must work to reach a high degree of harmonization with the other sectors. Moreover, there must be both coordination and coherence between inter-cluster e intra-cluster information management projects.

Every sector must work with the OCHA to establish the standards needed for good information sharing. It must share information and resources related to its specific area of competence, like contact lists, standards forms, datasets etc. Another primary feature of Information Management is privacy. It is necessary for each unit to establish an internal privacy policy. Data are indeed confidential and their sharing must take place only between clusters and within every cluster. In this complex exchange of information, the OCHA plays a key role. Basing on the seriousness of the emergency, the OCHA can allocate resources to coordinate the distribution and coordination of information, and create standards to organize a data-collection. As it may be understood at this point, Information Management needs an instrument to share information, a sort of network that enables to consult multiple resources in every moment, at every level. Such tool is the Information Management Network, a country level network which enables both the many actors of the emergency to keep in touch, and Governments to

[17] http://reliefweb.int/map/world/global-cluster-leads-june-2012

coordinate the Information Management and improve their work. Such network includes clusters and national authorities and indeed manages to provide a more productive communication at a global level.

It has to be specified that clusters work both at local and a national level; thus, they must adapt their rules to the national standards. Humanitarian actors who are involved in clusters must be active in the information-exchange process, creating standards to define common baselines and references.

As previously discussed, setting precise standards is important, for they facilitate the general interpretation of information. As a matter of fact, another organisation has been charged with this very task. The Humanitarian Information Centre[18] (HIC) was indeed founded to support the communication needs of disaster-stricken populations, combining information and data given by national governments and clusters. To be precise, the HIC takes action only in critical emergency situations, when neither national authorities or IASC manage to coordinate the efforts. The most significant principles adopted by the HIC to regulate the information-exchange process are relevance, objectivity, humanity, timeliness, confidentiality and verifiability (OCHA, 2002). Tough such principles may prove to be particularly useful during emergencies, especially as far as humanitarian information management and exchange are concerned, they should be applied in all types of communication (e.g. internal and external). In an intervention context, the principles which provide good communication conditions between sections, are mainly:

- **Accessibility**: information must be easily accessible for every organisation. In order to be such, it must be based on standard tools and translate information in a common language or in a local language. A major contribution of technology may be here found in its impact on information seeking. Electronic devices can indeed facilitate and quicken such process.
- **Inclusiveness**: information must be shared by stakeholders, associations and organisations with the government of a given disaster's stricken country. All agencies must first produce and then spread information and data, to improve the general organisation of the intervention.

[18] http://www.humanitarianinfo.org/

- **Inter-operability:** information must be accessible to everyone. Every cluster or sector must use it to improve the conditions of the local population.
- **Accountability:** organisations must verify if a given information source is to be trusted or not. It is for this very reason that they have to specify, for every document they write, the information's origin, source, authorship etc.
- **Verifiability:** information must be based on valid methodologies validated also by external sources.
- **Relevance:** information must be relevant and useful not only to solve problems and implement the information management, but also to decide which specific procedures should be started.
- **Objectivity:** organisations must be produce and consider information using a balanced perspective, in order to be reliable and provide ideas and solutions.
- **Neutral:** information must not be influenced by any political creed or thought, for, otherwise, both the analysis of the situation and the intervention could be damaged.
- **Humanity:** information must always respect the people affected by a disaster. More precisely, sorrow, as a condition, must not be used to provide a distorted picture of a country.
- **Timeliness:** every document and resource must be made available in a timely manner, to facilitate the information-seeking process.
- **Sustainability:** information should be open source and available to everyone, in order to be used in a future time as well.
- **Confidentiality:** some data are not public. Organizations must use them abiding by specific rules.(OCHA, 2008)

All such principles enable to solve problems in a more efficient way, and, moreover, to clarify the use of language while defining a situation (thus avoiding any misunderstanding).

It has to be point out that using such criteria can also help create standards to monitor the progresses made by every sector. Standards are given by locally and nationally-defined organisations, such as the OCHA, the IASC etc. When indicators have been decided, the new standard to manage information should

be harmonized by the OCHA and the Humanitarian Country Team. The main questions needed to describe the process are:

- What data are needed?
- Who will collect the data?
- Where will data be aggregated and processed?
- How often will data be update?
- To whom is information disseminated? (OCHA, 2008)

It must be specified, however, that technologies play a key role, especially in the management of large datasets. Here is an example. The OCHA's information management sector is divided in two specific sections: the Information Analysis Section (IAS) and the Information and Communications Technology Section. Such agencies work together to improve information-finding for the organisation members. Moreover, the OCHA is currently developing various technologic resources to manage information. Among them, there is the ReliefWeb[19], a platform that connects people and provides information about the organisation's initiatives and interventions, in a clearer and useful way.

However, these private and state run also need to communicate not only with each other, but also to interact with other organizations and agencies to implement the network and increase the effectiveness of rescue operations.

To implement the rescue work is fundamental to involve other stakeholders, not just those directly involved in crisis management, but also the civil society and all those who can contribute to help (donors, volunteers and the entire community).

So let's move to another aspect of crisis management: that of external communications.

[19] http://reliefweb.int/

5. External communication: media, web and initiatives to communicate with audiences

In the first part of the chapter I have dealt with internal communication, that is, how the agencies involved in the rescue process communicate and coordinate with each other.

External communication is another most interesting process. It concerns all the strategies and means used by rescue organisations to communicate with external actors, especially with the media and other types of audience. To be more specific, in this part of the essay I would like to analyse how donors, volunteers and the civil society, which can be either directly or indirectly involved in the disaster management, can share information and ideas. It is to be underline that external communication shows its value especially in the reconstruction phase, when support and help are most needed. In such hard moments, sensitising the audience, recruiting volunteers and collecting donations and aid are the first steps to be made in order to provide assistance. To better clarify what are the most efficient communication strategies generally used by organizations, I will now take into consideration the communication toolkits provided by global institutions such as FAO, UNICEF and WFP. Such analysis should also highlight the main principles and communication strategies used by organizations to implement their communication plans, especially during a crisis and in the rebuilding phase. Communication thus become an essential tools to:

- disseminate information during and after an emergency crisis;
- encourage public awareness and sensitise people to the issue;
- help raise funds and recruit volunteers;
- show people the work, efforts and value of organisation members and rescue workers.

Moreover, communicating to several audiences also means making use of different channels. The latter can be divided in traditional media (radio, television, newspapers etc.) and in new media (social media, web and blogs).

Now that such points have been clarified, let us identify what use can be made of the media and what does their effectiveness consist in.

6. Organisations and traditional media: radio and television. The importance of broadcasting communication during emergencies

For many years now radio, television and the press have been recognised as the major sources of information of the modern world. Their relevance during crises and emergencies is equally wide-known. For instance, it frequently occurs during natural calamities that the only media actually working are television and radio, for they have a powerful and articulated structure. Indeed, they are supported by local stations and reporters that manage to transmit information from marginal areas to bigger broadcasters. At this point, broadcasters frequently use a power generator in order to face the emergency and spread information to local authorities, police and hospitals. As it may be noticed, such communication tools are extremely useful in the later stage of the disaster, to convey information to the civil society. For instance, they can refer on the exact location of the emergency, providing both local communities and relief workers with maps. Furthermore, is to be underlined that people commonly find comfort in knowing the precise circumstances of the disaster and the current state of things. (ITU, 2014: p.3).

As it may be understood, the role of mass media is fundamental during crises, for they reach a very large audience that, moreover, does not need any specific competences to understand the message. Radio, in particular, is still largely used in third world countries.

Such resources are essential for organizations, allowing to communicate with the population and recruiting volunteers and forces to help in the reconstruction phase. Have relations with mass media indeed enables institutions to be part of the agenda setting and have a greater visibility to the community. During natural disasters, the agenda setting of the media changes, giving the priority to the humanitarian tragedy. It is at this stage that organizations should try to make themselves more visible and reach a large audience, to raise awareness on the tragedy, to recruit volunteers and donations, but also to provide the disaster-stricken communities with useful information. However, traditional media do have their disadvantages and limits (FAO, 2011: p.67):

- **audience location**: in some cases mass media tend to focus on urban centers and not pay attention to the lowest social classes;
- **difficult target**: mass media reach every target and not a specific target; if we want to send our message to a specific target mass media are not efficient.
- **low effectiveness**: mass media do not get in touch directly with their audience, therefore they risk to be less persuasive than others communications channels such as social networks and web sites.
- **loss of control**: when you prepare a message and give it to the media, they may transmit it in a different or modified way. When this happens, the authentic meaning of the message may be lost.
- **short-lived messages:** when a message is transmitted on the radio or television, people may miss it or mishear it, because of its oral nature.

As we can see there are advantages in using mass media to spread information. Yet, other channels may be more adequate in certain situations. Let us see what results can be obtained combining broadcasters with the Internet and social networks.

7. New media: social networks and the Internet. The importance of new technologies to promote and raise awareness on disasters.

Lately, traditional media have often been combined with the Internet and social media. These new tools are used in times of crisis to manage the emergency, but also they are great tools to attract audiences and to create new ways to communicate and sensitize people to the issue of environmental disaster. Not only during the phase of the crisis management. All the organisations use the same instruments in order to communicate with media, partner and society. In the last years they are orienting their communication action in the use of social networks and websites. (United Nations Department of Social and External Affairs, 2010).

The use of web during emergencies it is important for organisations because allows people to be involved in a more efficient way. Especially in the phase of intervention when afflicted people have to receive information and organizations

seeking new funds to help communities affected by the disaster. Through the use of social media people can interact and add personal contents. They can give useful information and help afflicted communities. Through the use of these tools they can connect people of different countries and different cultures and this is an advantage in order to create awareness about the problem of natural disasters and about the social implications it entails. Also in this case as for traditional media there are some negative aspects to take in consideration:

- Audience: referring to people who can or can not listen and read the message; not everyone nowadays have a tool that allows him to access the Internet and not all know how to use internet
- Participation: if not all have the possibility to access the internet then not everyone has the opportunity to participate in the interaction in the web world. Nevertheless the use of internet allows to create more interaction and in some case more mobilization.

The use of social networks allow to measure the follower response in order to adjust the communication process on the base of these results and analysis (Capable Partners Program, 2011).

This means that external communication became everyday more flexible because is not unidirectional, but it is becoming everyday more bidirectional. ICTs are used not only by organisations, but also from people who can participate in a more active way to initiatives and during humanitarian crisis.

8. IGOs: communication strategies and toolkit to communicate during humanitarian crisis

It is very important the communication of IGOs aimed at audiences such as printing and donors in crisis situations and natural disasters. Printing and donors are two very important categories because in crisis situations they play a key role, to act as a bridge between the organizations and the population. The objectives are manifold; the usefulness of this communication is given by:

- make available to affected communities information useful to face disaster
- To sensitize people to the issue
- Raise funds

- Transmit a good image of the organization in order to attract attention and be able to attract the interest of more people

The ultimate goal of all this it is to have more visibility especially in times of disaster to get more aid, but not only in times of crisis and disasters. Keep in mind though that these organizations do not cease to exist ended the disaster. All organizations use the same strategies for this reason I have considered three of the main organizations to analyse what are the important aspects to be considered in the communication process. For each of these organizations I have analysed some aspects in my opinion relevant, not only for the single organisation, but in communication in general and therefore also be extended to other organizations.

8.1. The importance of the audience: FAO communication toolkit

To understand the importance of the audiences it may be interesting to analyse FAO[20] communication toolkit. The *Food Security Communications Toolkit* contains all the rules to manage the relationship with media in order to have a more efficient communication. It was projected by FAO in collaboration with the European Union. As previously mentioned, FAO has different audiences such as donors, policymakers, clients or potential project beneficiaries. However, FAO's principles for good communication are applicable to every organisation.

It is to be underlined that, depending on the audience, the message is different. When FAO divulgates information it has to pay attention to the peculiar traits and characteristics of the target (e.g. education, age, location, language, previous knowledge etc.). This analysis is particularly relevant when FAO has to do a strategical communication in order to promote its work and projects. For communication to be efficient, it is fundamental to prepare an efficient communication plan based on an in-depth analysis. Of course, the right communication channel must be selected and specifically thought for a single kind of audience. Let us look at some examples:

[20] The principle function of FAO is to give assistance to developing countries' people bringing and distributing food them. They have a fundamental role during humanitarian crisis. The function of FAO is also to obtain founds by organisations in order to reach its goal so they need news media in order to let they know and to obtain financing.

- **large audience:** mass media as radio or TV are employed. Such tools may be perfectly adequate for an illiterate audience. However, other instruments that can be used to communicate with a large audience such as the press, require people to be educated or at least literate. Banners or signboards may be effective as well;
- **Medium-sized audience:** computer and web resources such as social networks, chat or email are employed. They can prove efficient for a literate and more specific audience, like people who are interested in humanitarian and social aspects and donors who follow FAO's activities;
- **Small-sized audience:** direct interaction is employed. It includes training sessions, meetings, field visits, demonstrations, speeches, sermons and video presentations (FAO, 2011: p.37). This strategy is increasingly used to communicate with people who are directly involved in FAO's activities.

Another point that should be considered is that communication strategies are fundamental because most institutions work at a global level. Hence, they must be always connected with the other actors involved in the crisis management (media, organisations, donors, etc…) to work together in harmony and achieve results. For such reason also it is very important to identify not only the dimension but also the type of the audience the institutions want to reach. Quite accordingly, FAO has conceived its communication strategy in three major points:

- communication used during internal staff activities;
- communication dedicated to the description of activities directly liked to FAO in collaboration with other corporations or institutions;
- communication based on activities or facts primarily depending on other organisations in which FAO is involved (FAO, 2011).

The first point is related to both internal and external communication for, though it involves FAO staff and people within the organisation, it includes problem discussion and agenda setting procedures made by email and newsletter. It is a communication process made to implement the awareness on what the organisation does and not only on the technical aspects if emergency

communication. This is the reason why I consider this aspect as an example of external communication. In this case, members of the staff are considered as an audience and, in order to communicate with them, the organisation uses the same instruments employed to reach donors and other audiences. However, FAO tries to encourage dialogue among its internal staff. Moreover, FAO divides communication competences depending on the “focal point”, in order to make easier for people to find response to a precise problem or to inform on a specific topic or event. Finally, another interesting feature of FAO’s communication strategy is that there is a specific staff who has the task of creating dialogue both among members of FAO and with other audiences. FAO has a specific department that works in multidisciplinary teams to project communication strategies.

The second point focuses on communication with external audiences. In this phase, a mailing list may make the difference for email is the most largely used web resource. However, mailing lists should be periodically revised.

For information to be widely spread, communication should be multichannel-like to capture the attention of every possible kind of audience. There is more. It is communication that enables FAO to illustrate its values and guidelines. For an institution, showing its humanitarian aspect is key to get the attention of donors and philanthropic institutions, while explaining the main mission and operations to the public. It is for such reason that FAO always try to implement its credibility through workshops, meeting, conferences and every type of event that can stimulate debates. Another primary initiative carried on by FAO is keeping an open communication channel with the media, providing them with background material such as fact sheets, booklets, data and videos footages. Indeed, it is FAO’s objective to build and spread its own side of a story; a side that must be narrated by the media to offer a good image of the organisation. It should be no wonder that FAO, as many other institutions, responds as faster as possible to calamities also using the power of media to spread information and facts.

The third point of FAO’s communication strategy relates to strengthening partnerships with other organizations with the aim of involving and mobilising the

public. FAO also supports some events that are relevant for their mission such as *World Food Day*[21] and *Food for All.*

Though we have already dealt with the main aspects of FAO Communications Toolkit, other points should be considered:

- timeliness: media publish only new stories to interest their public;
- interest: a story must be interesting, for people are attracted by engaging news;
- audience: organisations have to adjust their messages depending on the audience they want to address to;
- relevance: people tend to give more importance to things that are related to them, for they identify themselves with the story;
- significance: news may have a different relevance at a local, national or international level. The message must be created on the basis of this aspect;
- conflict: people are more interested in stories that show conflicts;
- novelty: unusual stories tend to be more appealing to the public.

In other words, the audience, the nature of the message and the values it displays are all key factors to offer good communication. What does good communication bring to an organisation? Visibility, popularity and influence.

8.2. Transparency in the communication process and the use of new media: UNICEF Communication Toolkit

Information transparency is an essential point of UNICEF[22] policy.

Transparency enables an organisation to be considered more reliable by the public. Another very important aspect related to this point is providing access to all materials and documents to both relief workers and common people. To be more precise, in the UNICEF website there is a section called “Transparency portal” (http://open.UNICEF.org/) where it is possible to find every detail on their

[21] World Food Day, http://www.worldfooddayusa.org/, accessed on 20 July 2016

[22] UNICEF is an organization That Becomes permanent part of the UN in 1953, the aim of this organization is to protect children and help them through education and their integration into society. UNICEF works in developing countries, but not only, and is one of the main organizations that provides aid in communities affected by war epidemics or natural disasters.

programme. This is useful for donors and people who want to finance their projects because they have access to every data about what and how much they spent. In emergencies cases the first thing that is important to do is finding donors who want to finance the project and in this case communication plays a relevant role, but not only donors, also communities have to be engage in the intervention during humanitarian emergencies.

As for other organisations, social networks is an essential part of communication for UNICEF during emergencies. They are considered as institutional instruments to communicate and to give information about the organisation's work. Social networks are a good mass instrument give information to common people who are not directly involved with organizations. Social media are instrument of mass communication. They can generate positive media coverage, their power depends on the relations' strength that can be create inside the virtual community. Indeed, every organisation uses social media in order to promote its work, but also to attract interest on its work and to communicate with people of the community. Social networks are important not only to raise funds , but also to communicate during emergencies. Not only UNICEF, every organisation has social networks' profile and the rules to using them are the same also for the other organisations. UNICEF uses its social networks not only to have contacts about journalist or media coverage but also to communicate with the affected population (UNICEF, 2012: p.10). In conclusion, social networks are important tools not only during disasters when organizations need founds, but also before and after disasters to create a good reputation and obtain the support of the followers.

UNICEF uses many platforms, not only Facebook and Twitter, but also Flickr, YouTube, Google+ and SoundCloud. Let us clarify and consider some examples:

- ***Facebook****:* it is an important instrument during emergencies because many people use it to see what people, organisations use it and institutions share. Users can also share documents and photos and this is very important for organisations for they increase the organisation's popularity, there are more probability that people can see and share contents. But also is an instrument to have relations with users and know what they think about a question reading and replying comments. As we will see in the

second chapter Facebook useful for another function called Facebook Safety Check during natural disasters.

- ***Twitter**:* it is used to spread information as text or links in real time during a disaster (UNICEF, 2012:p.13) is an important instrument to get funds. The use of tags give the possibility to follow a specific argument using a specific tag. During emergencies are especially used tags as #earthquake, #flood or #tsunami combine with the name of the afflicted country. Twitter is useful because give the possibility to give information in few words (140 characters). In the second chapter this theme will be discussed in more detail.
- ***Google+**:* with this platform that is connected to the other socials is possible to create specific pages for every event and is possible to get know to the other people the existence of this page, is an instrument to inform in a more detail way about a specific argument and connect with other organisations in order to be more known. Is useful to share specific content as report or technical documents. With this instrument is possible to share information to a specific group of people.
- ***YouTube**:* in YouTube is possible to share videos in the official channel. The most famous videos are sharing by people also through different channels as Facebook or Twitter. Is useful because it shows with videos the reality about what happen during disasters as an earthquake or a flood and is an instrument to sensitize people because visual materials has more impact than write material.
- ***Flickr**:* it is used to share videos and photos, is useful for mass media when they have to talk about natural disaster, but they don't have good images so they use as support the images founding in this platform. We know that use of images not only in social network, but also in newspaper and television are used to sensitize people and this is good to mobilize people to contribute and help afflicted populations.
- ***SoundCloud**:* this is not a real used platform but is a good tool to share audio recordings through other social networks, blogs and websites. It is a good way to share information if there are not photos or videos.

In light of what we have seen social networks are important tools for creating engagement and foster debate and discussion among users. Internet and social media then become a mobilising tool.
Social networks are not the only tools that create involvement; there are other ways to capture the attention and involving a large number of people.

8.3. Events, collaborations and partnerships: World food programme communication strategies

WFP[23] is another important organisation involved in fight hunger as FAO.
As the other organisations WFP works at global level. This organisation valorises the external communication at global level as the other organisations do. They highlight the importance of donors in their walk talking with televisions, radios and newspapers. For their communication they don't need the help of advertising agencies because they manage their public communication only by themselves (WFP, 2008: pp.6-7). They use as instrument of communication their website and Communication Division, an organisation that is the public face of WFP, that participate also to public events in order to sensitise people to understand the importance of give a contribution to their mission. This organisation communicate also with Private and Government Donor Relations (WFP, 2008: pp.6-7). It is very important for all the organisations to collaborate with Governments and other associations in order to do a more strategical action. The main mission of WFP's Communication Division it is to communicate what they do and the results of their work. This is because they need the attention of the audience and they want to create awareness among people (WFP, 2008: pp.6-7). They show to their audience the importance of they work not only during crisis, but also after disaster. Their principles audiences are:

[23] Its main goals are help people and countries' development trough food, give logistic support in order to help afflicted people. They also promote food security in collaboration with FAO and United Nations Department of Humanitarian Affairs, UNHCR, other relevant agencies and non-governmental organizations. WFP is involved in the prevention of disasters and to implement the distribution of food during emergencies and to implement also the resources of every single country and the efficiency of their work.

- **Humanitarian and development partners and opinion leaders in donor countries** because WFP has 30 donor countries and there are new countries as Argentina, Brazil, China, India, Saudi Arabia and South Africa. These have priority especially journalists and academic in order to built public support.
- **Host governments, local authorities and beneficiaries** because for the organisation is important to create collaboration with local authorities that can give useful information and instrument to give a more efficient response when there is a crisis situation.
- **The general public and the Internet.** Internet was very important for this and also for the other organisations because is very expensive to speak and to give messages to the public using television and with the use of the web this is no more a problem. In some countries people use computers more than television and they can contribute in create and send messages about what WFP do publishing user generated content and personalising the message. With the use of Internet is also possible to talk to more people than before and personalise the content for specific subgroups of people and depending on the country and the culture (WFP, 2008: pp.6-7).

WFP uses many different communication tools depending on different situation or goal that would obtain and depending on the audience:

- professional staff and people who work in order to respond to the media questions and creating contacts with journalists, organising conferences and events in order to add new donors and volunteers and consolidating relations with people who already work and collaborate with them;
- relation with media at local, regional and international level including journeys dedicated to let know the organisation;
- website (www.wfp.org) use to shown everything about the organisation in ten different languages;

- editorial materials published in newspapers and blogs because they want to values the web opportunities, but also other online resources such as computer games like *Food Force* (WFP, 2015)*;*
- WFP *Annual Report* that is an important publication where there is the description of what is done every year in order to fight the hunger and other specialised information referring to this field and Hunger Map;
- audiovisual resources also are very important to communicate with people in fact WFP use to communicate through national and international TV channels and their videos are transmitted in public places such as airports and train stations;
- national and international Public Service Advertising that do not only show videos but also photographic materials.

Besides material as photos videos images news and reports it is very important also the collaboration with famous people because this give the possibility to involve more people in this battle against hunger. WFP has often involved in its projects celebrities. Drew Barrymore, for instance, supported many projects. During the earthquake in Haiti, she made a statement to her fans in order to collect funds. The presence of celebrities combine with the use of social network is very efficient in order to keep consensus because people are more influenced by people who they love or admire. The list is very large because there are many other actors who are WFP ambassadors as George Clooney or Christina Aguilera, Michael Kors, Josè Mourinho. People who come from different sectors (music, sport, cinema) therefore they can spread the message to different audiences. WFP manifests its presence also in the major sport events for example in the Rugby World Cup (Murdoch, 2015) in which they has raised nearly US$2 million to provide food for people in emergencies. They use unusual channel or not directly related to their field in order to capture the attention of a large number of people. For example rugby was follow by an enormous number of people and combine people of different culture who derive from different experiences. Sport is something that unify people and it is a powerful instrument to take advantage in order to spread a message.

WFP uses also to spread its mission through gadget such as t-shirt, stickers, flags and other objects that promote their brand also with the presence of collaborators dislocated in every part of the world especially during important events such as concerts and conferences that give to WFP the possibility to be more known. For example the WFP in collaboration with UNHCR organised a concert dedicated to Pavarotti and the found rising were used to help people in Pakistan.

There are other fundamental collaborations such as TNT and Unilever for two different reasons: the popularity that this collaboration gives to the association and for the found rising that these corporations give also through the organisation of the events. Unliver for example collaborates with WFP since 2007 in different projects such as 'Together for Child Vitality' and 'Project Laser Beam'.

TNT was the first corporation to cooperate with WFP. They started in 2002 and have collaborated in more than 30 emergencies ever since, such as the Tsunami in Asia in 2004, the Pakistan earthquake in 2006 and the earthquake of Haiti. They also participate in events and campaigns against the lack of food and hunger, one of this events was Walk the World. From 2006 TNT works also in collaboration with school meals programmes in all over the word especially in Gambia, Tanzania, West Africa, Nicaragua and Cambodia.

WFP considers the participation very important, it tries to involve people in a most practical way through initiatives, but also with other instrument.

This organisation publishes also policy papers in which they describe the most important missions made by WFP, but also they publish papers focused on issues related to different aspects and debates emerged during workshops or events or emerged among public opinion. Another important document is World Hunger Series[24] a document that illustrates the different policies created by institution and governments and the different strategies in order to manage the lack of food and to improve its production.

They use also the support of associations located in USA and Japan that contribute to support the communication strategies of the organisation and they

[24]WFP, World Hunger series, http://www.wfp.org/policy-resources/corporate?type=367&tid_2=All accessed on 18 July 2016

have also the support of a good staff of people who make campaign in order to sustain the WFP policy.
Partnership and collaboration are very used by these organisations not only with other IGOs, but also with private sector as we will see in the second chapter.
They want to transmit their efficiency during difficult situations reporting what they do and their victories during their interventions. Innovation and creativity are other values that they underline also because difficult situations require good capacity of problem solving. They pay attention also to stories and to human contact, they make a communication that creates a relation of trust with people and donors to gain their support and consolidate their aid. As the other organisation transparency and honesty are important values not only in the work but also in the communication and this because people who help these organisations make a philanthropic act that they can't concretely see how their money are invested, so is an obligation of the organisation to devolve in a concrete way the results of their charity. They also try to promote the internal economy of the single countries improving their agriculture and their infrastructures collaborating with a large number of other organisations involved in other tasks, but that share the same goals.

All that has been said about the communication strategies used by agencies analyzed can be summarized in a few key points that are:
- importance of the audience;
- use of different tools and channels;
- importance of involving people telling stories or creating events;
- collaboration with other organizations;
- transparency: highlighting always what you do and what it has already been done.

To do all this, there are different ways of involvement, from the use of traditional media (TV, radio, newspapers), to the organization of events through social networks.

The utilization and diffusion of social networks and new technologies as we will see now it is not important only for organizations, but it gets more and more important also for the population and in crisis management.

The diffusion of technology to face natural hazards: mobile devices and telephone applications

This chapter focuses on the analysis of technologies and strategies used during natural disasters in order to manage disasters and in some cases to prevent or reduce their effects. The analysis underlines two groups of communication strategies used in these situations: the first one is the use of social networks and applications for smartphones; these are important because of their diffusion in the last years and because they change communication modalities, but also because of the issue of access to these instruments. The second part of this chapter focuses on the partnership between IGOs and private sector, which is fundamental. The importance of this aspect is given by the collaboration between these two types of organisations. Particularly in these last years, the collaboration between private and humanitarian sector was intensified and this is a very useful and positive element for multiple reasons. The private sector in the last years has started to be much more sensitive toward humanitarian aspects and it encourages people creating an involving movement. The private sector is also an important donor and supports the initiatives of organisations giving financial support and improving the brand reputation. I would like to focus particularly on collaborations that generate new technologies that face difficulties during crises and to help people after natural disasters when they happen.

In this chapter I will analyse different kinds of technologies used by people to face emergency situations, I will give an overview analysing the use of different tools used by civil society and organisations. In some parts of the chapter I formulate personal reflections about this field in constant evolution, but also some opinions are dedicated to the private sector and organisations about what they do and what they should do in order to carry out more efficient work. In the chapter some examples are summarized, I would to analyse in the third chapter the concrete influence that technologies have in this field especially in the last few years.

1. General overview of ICTs access in the world: the importance of mobile devices

The later years have been characterized by a worldwide increase and spread of new technologies. The key role of such powerful instruments is everyday more visible and it involves an always larger number of the individuals. Indeed, unfortunately, not everyone has an equal technology access. In 2010, Morgan Stanley[25] estimated there were 830 million Internet users at the end of 2009 and people who have access to Internet were 1.7 billion, this data are reported in "The rise of social networking. Changing the web as we know it" (ITU, 2010). When we refer to the Internet access, we have to take into consideration computers, as well as smartphones and other instruments, such as tablets. In 2011, the bank Morgan Stanley predicted in its report *Tablet demand and Disruption* that, in 2020, mobile Internet will be employed by 10 billion of users (Morgan Stanley, 2011).

First of all, the importance of tablets and mobile devices is given by their convenience; indeed, as we can read in the report, a large number of people use them at work. However, such instruments can serve many a purpose, such as reading articles, producing materials and generating contents and information. Moreover, mobile devices may be also crucial while facing disasters or in emergency cases. When people are forced to leave their houses and their things, the only instrument that they are able to bring along are telephones, to keep in touch with family and friends. Mass mobilization is constantly growing and this is one of the reasons why Internet fixed networks are decreasing, in comparison with Internet mobile networks. People need to communicate and to keep in touch with the rest of the world in every moment; Internet serves such purposes more than all the other instruments of communication. We can access to broadcasters using streaming channels. Internet is also important to produce information; it includes in itself television, radio, telephone and more. It is virtual community; web users are major characters, for they can publish contents and actually produce information. There are many websites that share user-generated content, such as Youreporter; here contents are principally posted by users. This

[25] Morgan Stanley is an international bank, based in New York, more information are available at: https://www.morganstanley.com/

is very attractive for people, because what is posted by common people is perceived as more real than what is transmitted on television. Through such platforms, users can post instantaneously what is happening. If a hurricane or a volcanic eruption occurs, they can share videos and photos to show to the world what is happening. In dramatic moments such as these, platforms enable to spread information and sensitize society. The same concept is applicable to social networks such as Facebook, Twitter and other applications in which contents are published not only by official sources, but also by common people. This phenomenon enhances mobilisation, for people are generally more involved; during natural disasters, for instance, users give a prompt response, and this is extremely important in emergency cases. (Valentini, 2013: p.2)

1.1. Mobile applications: social networks, Facebook and Twitter

As previously affirmed, the smartphone is one of the objects that people use more in their life. Not only teenagers, but also adults and aged people daily engage with such instrument. Smartphones give us the opportunity to communicate with people in real time, not only through SMS or calls, but also through social networks. There is also an important consideration to be made, before starting an analysis. When we talk about social networks we commonly consider them as mass tools, for the majority of people possesses them, but it is not entirely true. Organisations and institutions use them as official channels to communicate with people; they receive and analyse feedbacks and responses from their followers. There are two different ways to use social networks, that is, in a formal way and in an informal way. Hence, we can analyse such instruments from two different perspectives; the first will deal with the massive use of social networks, and the second with that is their institutional use. Such method is applicable not only to social networks, but also to other mobile applications. We can consider every application from both sides, analysing the two perspectives, in order to have a more complete vision of these instruments and to better understand their impact on all levels.

The social networks that are most used, both for institutional and non-institutional communications, are Facebook and Twitter. It is for this reason that I would like to examine in depth these two applications and their use during natural disasters. A distinction has been made between the functions of social networks before, during and after a disaster.

I believe such distinction to be essential, for, as previously stated on crisis management procedures, operators intervene before a disaster (prevention phase), during it, and at end of the emergency (rebuilding phase). To properly deal with the different stages of the procedure, there is one point to clarify. According to the report "The role of social media in crisis preparedness, response and recovery"[26] written by Jason Christopher Chan the primary principles that characterise social networks are collectively and collaboration. Such values are closely connected to one another; indeed, a social network consists in a large group of people who together create a virtual community. The degree of effectiveness of a social network is directly proportional to the way it involves the users. If people share their contents with other users, they create a net of relations and interests. Social networks are based on materials produced and shared by different sources. One of the networks' major advantages is indeed the interconnection between different sources and different audiences. In Facebook, as in Twitter, we can share an article we have previously read on an online newspaper or on a blog, simply copying the link of the source on our web page. By doing this, all the users who follow us can see it, find and analyse new sources and maybe even become interested in new ideas. The information-sharing process is important not only for common people, but for crisis managers as well. Indeed, they make a scientific use of the social networks. They study the social and emotional impact of a dramatic event on the public analysing documents and materials taken from social networks, and gathering information. In his report, Jason Christopher Chan has identified four steps in the crisis management procedure, in which social networks play a key role. In the preparedness phase, which consists in planning and training before disaster, information is widely

[26]http://www.oecd.org/governance/risk/The%20role%20of%20Social%20media%20in%20crisis%20preparedness,%20response%20and%20recovery.pdf

spread. However, information sharing and gathering are also essential during the crisis phase, to solve problems and make decisions, and during the recovery phase.

The second phase is necessary to spread a clearer awareness on the possible risks and hazards for the people.

The third phase, instead, is based on training people to be prepared in a crisis situation. In this phase the method of gamification is frequently employed. It consists in a virtual reproduction of reality, and its aim is to make understand, in a more efficient and captivating way, what managing a crisis actually means. Gamification is such an interesting and complex concept that can be hardly explained in a few words; it is used in different fields as business, marketing, health, in and in crisis management procedures caused by natural disasters (Yukaichou, 2013).

The fourth phase concerns the sharing of information, which is often crucial during emergencies. Indeed, using ICTs can help organisations to collect data and to analyse in a better and prompt way what has occurred. This is particularly true when aid organisations help communities to rebuild what they have lost.

1.1.1. The widespread use of Facebook and its role during natural disasters: Facebook Safety Check

The utterly famous Facebook platform was first launched on 4th February 2004. During the years, its founders have gone so far to conceive also a tool of disaster response connected to the network, the **Facebook Safety Check**[27]. The system was launched on 14th October 2014 and it enables users to communicate with their friends during emergencies, in order to reassure them on their current condition. The application gives people the possibility to communicate with their family and friends, and more specifically:

- to let know that they are safe,
- to declare that some of their friends are safe,
- to check if friends of theirs, who are located in the affected area, are safe[28].

[27] https://www.facebook.com/about/safetycheck/

[28] Facebook, http://newsroom.fb.com/news/2014/10/introducing-safety-check/ accessed on 2nd August 2016

When the tool is active on a mobile device, and a user is currently located in an affected area, Facebook automatically sends him/her a notification asking if he/she is safe. In order to perform this task, the application takes information such as:

- the place where from people are connected to the Internet;
- the exact location of the user;
- the locations that users have listed and registered on their personal web page.

If the user is not on the exact place of the disaster, he/she can communicate it. If, instead, he/she actually is in the affected area, but he/she is safe, he/she can select the option "I'm safe". The user may also select this option on behalf of his/he safe friends as well. If, on the contrary, a friend of the user is in the affected area, Facebook automatically sends him/her a notification.

Facebook Safety Check has been widely employed in a variety of occasions, including natural disasters (earthquake in Afghanistan, Chile and Nepal, cyclone Pam and typhoon in the Philippines), and terrorist attacks. Indeed, though the service was originally conceived to be used during natural disasters, it has proved effective for humanitarian crises provoked by humans, such as terroristic attacks (Ruffilli, 2015).

That said a consideration must be made. Even though such instrument can be useful for people who live in developed countries, where everyone has a smartphone and an Internet connection, it is not applicable to people who live in developing countries, for example Nepal or Afghanistan. To partially solve this digital-divide problem, Facebook has launched, in partnership with mobile operators, a project called *Internet.org*[29]. Such project has the goal of bringing Internet access to the two-third of the world that does not currently have it. Moreover, to facilitate the dissemination of services, Facebook has implemented another project. *Free Basics by Facebook*[30] is a service that guarantees a no-data-charge Internet access, in order to inform people on topics such as the latest

[29] Internet.org, https://info.internet.org/en/, accessed on 3rd August 2016
[30] https://developers.facebook.com/docs/internet-org

news, health and education. Such initiative was promoted in different places, and precisely in 44 countries of the world, from Africa to the Middle East, from Asia, to the Pacific and to Latin America. The main issue to be faced was, indeed, that though a big part of the world has a cellular coverage, Internet connection is usually expensive and people from many countries cannot afford it. It is for this reason that Facebook, in cooperation with the private mobile sector, promotes the spread of free Internet access. The program has been divided in different phases. The first part of the project consists in teaching people to use the Internet, showing its values and inner potential (Free basic by Facebook, n.d.).

In order to implement these services, Facebook has launched demographic Insights for developers who implement this service. The *Insight service*[31] gives the possibility to enter the demographic database to classify the variety of users (age and gender, for instance), in order to adapt different contents to the user's features (Internet.org, 2016). Moreover, Facebook, in cooperation with Ericsson, has worked intensely to help developers to understand and perfect their research on this theme, creating the *Internet.org Innovation Lab*[32]. Thanks to the Lab, it has been possible for developers to face and solve technical problems everywhere, and make tests to improve the Internet access in case of bad reception or connection. The project is significant for different reasons:

- it brings an Internet access in developing countries, thus improving social and economic conditions,
- it shows how cooperating with the private sector can be crucial;
- it focuses on the respect of cultural differences.

These are all fundamental elements to enhance the spread of technology and offer new instruments to face difficulties. More technology means more instruments and more sources.

[31] https://developers.facebook.com/docs/platforminsights/domains
[32] https://www.ericsson.com/news/1763215

1.1.2. The use of Twitter by IGOs and its role during humanitarian crises: Twiplomacy and Twitter Alerts

Another important tool that has been conceived to face emergencies was invented by Twitter, another famous social network.

The distinctive trait of Twitter is that it enables to communicate a concept in a few words (140 characters). This is an extremely advantageous feature, especially during emergency situations, when rapidity is essential.

Twitter is a widely-known application; it is a sort of "mass tool". Especially during natural disasters, when a mass mobilization occurs, social networks have the same functions of traditional mass media. Though they inform people, as traditional media do, the information material here is made by users. Social networks, in this case, are very important, for they respond to the people's need to have more detailed information. As it is, when people must confront a humanitarian crisis, they naturally need to search for other people and share information, thus virtually rebuilding the community that the natural disaster has destroyed. Social networks can indeed offer this service: users can here share their experiences in a virtual way, and let other users to emotionally participate to their life, through comments and material-sharing.

Like Facebook, Twitter as well has designed an application for natural disasters, **Twitter Alerts**. In case of emergency, if you are registered and have a user profile on Twitter, you can receive a notification. On 25th September 2015, Twitter launched this new tool in order to provide its users with news and information during crisis moments[33]. To be exact, they first launched *Lifeline*[34], an application available only for Japanese people. Japan is indeed frequently affected by natural disasters, especially earthquakes. Twitter Alert was launched after a while. Unlike Lifeline, Twitter Alerts is available in every part of the world and has the same functions of the Facebook Safety Check. If you log in to Twitter and you have a Twitter account, you will automatically receive a notification and also a SMS. Through this application, organisations can alert people before an

[33] Twitter Alerts, https://blog.twitter.com/2013/twitter-alerts-critical-information-when-you-need-it-most accessed on 2nd August 2016

[34] Twitter Lifeline in Japan, https://blog.twitter.com/2012/a-new-lifeline-in-japan accessed on 2nd August 2016

emergency occurs, or they can give instructions to face the situation. They are also able to give instructions about evacuation, give safety alerts, inform people about available services or resources access, and give information about means of transport (Coyne, 2013). Several organisations are involved in this project, from every part of the world[35]. The organisations that use this service are:

- law enforcement and public safety agencies;
- emergency-management agencies;
- city and municipal governments, as well as their agencies and representatives;
- county and regional agencies, providing services to cities and municipalities;
- selected state, federal, and national agencies and IGOs (Coyne, 2013).

Twitter has been used during many different emergencies, not only natural disasters, but also during terrorism attacks, like the Facebook Safety Check.
As a matter of fact, Twitter has published several studies on this topic such as "How International Organisations use Twitter", particularly dealing with the phenomenon known as Twiplomacy, which:

> "is an award-winning study of the use of Twitter by world leaders, governments and international organisations, conducted by leading global public relations and communications firm". (Twiplomacy, 2013)

Behind this yearly-published report, we may find the most influential organisations in the world. To better understand the importance of Twitter during humanitarian crises, we can take into consideration the list of organisations involved in the management of disasters, such as FAO, OCHA, UNICEF, UN and WFP.

[35] Twitter Alerts, the list of organisations that participate to this project is available at the link:https://about.twitter.com/products/alerts/participating-organizations accessed on 2nd August 2016

This analysis utterly confirms the constant grow, both in terms of spread and influence, that Twitter has experienced in the later years. Such tendency can be noticed, for instance, comparing the 2013 report with the 2015's. In 2013, UNOCHA sent about twelve tweets every day, and it was one of the most active organisations on Twitter. To understand what kind of tweets are published by organizations during emergencies we can take in analysing the most popular tweet of OCHA in 2013 about the earthquake in Iran, in April 2013.

Figure 4. UNOCHA post on Twitter

As we can see from this example organizations share information about the places where they are involved and the activities they perform. Most tweets produced by organizations in times of emergency; as in this case, serve to:

- indicate the place where the organization provides aid,
- give information about the disaster,
- provide data and figures,
- give information on activities and aid that the organization is providing.

Several posts of UNOCHA were then re-tweeted by other humanitarian relief organisations, thus showing a certain degree of coordination and collaboration, also on a virtual level.

As a matter of fact, the UNOCHA too re-tweeted post shared by other agencies, such as WFP, UN, Refugees and UNICEF. UNICEF was the most followed organisation having, in 2013, more than 2 million of followers. It could boast a

good interaction with their users, and it is still one of the most re-tweeted organisations. UNICEF first started tweeting in 2009. Even the FAO, in 2013, was followed by many users, sending an average of 10 tweets every day. WFP, on the contrary, was the tenth most followed organisation (Twiplomacy, 2013).

The report of 2016 shows that UN is the most popular organisation, followed by 296 leaders of the 793 who have an account of Twitter (Twiplomacy, 2016) . To tell the truth, UN was the most popular in 2015 too, being followed by 250 of 699 leaders. This statistics clearly show how the number of followers has grown in a year's time. Another important data that we may notice is the constant increase of the number of leaders who use Twitter as a communication channel. In 2016, UNICEF was the second most followed international organisation.

Furthermore, in this research it has been underlined that the degree of influence of a Twitter account is measurable not only basing on the number of followers, but also on what kind of followers they are. For instance, in 2015 the UNICEF Twitter account was followed by 153 world leaders (Twiplomacy, 2015). The advantage of Twitter may be found in its combination of informal and formal communication. Politics and authorities can use it to as an institutional communication channel. Hence, communication may be perceived as both an official and popular tool, for it reach a wide audience. It is a modern way to communicate, being accessible to every person who has an Internet connection and a proper device. Twitter makes possible to share ideas with a larger number of people and with many different targets; it is probably for this reason that it has notably increased its power in the later years. Indeed, if we make a comparison between 2013 and 2015, we will notice how the number of people and organisations having a Twitter account has grown, and how it is used as an institutional communication instrument. In 2015, UNICEF posted an average of 17 tweets every day. (Twiplomacy, 2015: p.192)

UNOCHA tweeted eight times a day, giving voice, with their hashtags, to several affected populations, sharing photos and materials related to their work with the aim of raising awareness on such matters.

In 2015, WTP had sixty re-tweets for every tweet it posted. (Twiplomacy, 2015: p.192)

In now has other accounts, depending on the specific sector it deals with (logistics, media etc.). The accounts founders use different languages, as other organisations do, such as English, Spanish and French. However, WFP also writes posts in Arabic, Japanese, German and many other languages. As reported in the first chapter of this essay, every organisation uses these instruments with similar goals, though some of them are more active in the process. But social networks are not the only applications used in time of crisis. Thanks to the proliferation of mobile applications this market is everyday wider.

2. The proliferation of mobile applications

Lately, it has been argued that some mobile applications, or "apps", as they are commonly referred to, may be successfully employed during natural disasters. However, in order to properly identify and classify such special resources, it is necessary to provide a clear definition for them. According to the Internet Society Global Report of 2015[36], mobile applications are:

> "computer programs that are downloaded to smart devices and operated through an icon that is put on the smart device screen. They are usually available through online applications distribution portals, or app stores, which are typically operated by the developer of the mobile operating system (mobile OS), such as Apple or Google. Many apps can operate offline, interacting with the Internet at varying intervals; others are based on continual real-time interaction. Such apps, designed for a particular OS and available from a particular app store, are often called native apps". (Internet Society, 2015: p.25)

Let us have a general look at the main features of applications. Mobile applications can be downloaded using either smartphones or tablets. Such process only requires an Internet connection, even though some apps can also

[36] It is currently available:
http://www.internetsociety.org/globalinternetreport/assets/download/IS_web.pdf

work offline. In some cases, an app can properly function only on a particular operating system.

As much as the social power of applications is concerned, some programs, including WhatsApp, Facebook and Instagram, have reached such a level of popularity that they influence a lot of people's lives. It is for this reason also that the mobile application market is quite extensive, at the present time, and it is still enlarging. The most relevant consequence of such tendency is to be identified in its creating a worldwide business, thus establishing a virtuous economic cycle. It is the so-called "app economy", which consists in:

> “all sources of value associated with the app ecosystem, including not only revenues from app stores and advertising, but also economic activity generated via sources such as in-app purchases, services for app developed and commissioned app development”. (Internet Society, 2015)

By now, our use of applications is connected with many different aspects of our life. Shopping, purchasing tickets for an event, booking a vacation are but a few of the almost limitless possibilities applications can offer to the user. Moreover, a group of apps has been specifically created to properly regulate and manage administration and health issues, thus giving access to some services that were not available on cell phones before. For further reference on the matter, the ITU report of 2015 provides a quite detailed description of the functions, development and influence in the market that applications show nowadays.

Applications are either for purchase or free. What some people are not aware of is that the geographical legislation can affect the cost of an app. Depending on the country, an application can be either free or paid. This said, it has to be underlined that the business they create is not only related to their cost, for it includes advertising and the resources generated by the market.

The majority of applications are not subject to any geographical licensing restriction, which makes them available in many countries. This is an advantage, because an application, in order to function properly, has to be made known and used by a large number of people. When users are alone with their smartphone,

they spend most of their time engaging with applications. Indeed, such habit seems to be increasing day by day, especially in the United States:

> “In the 12 months June 2013-June 2014, mobile grew from 51% to 60% of digital media time in the United States, with the share of this time from app usage also growing. In early 2014, time spent engaging with mobile apps exceeded that spent on desktop computers, such that by June 2014 mobile app time made up over half (52%) of all US digital engagement.” (Internet Society, 2015: p.62)

In the US, people do spend more time engaging with applications than they do with computers. Even though, at present, such statistic seems to be valid only in the American territory, in the future there could be a different scenario. America's great economical power and influence may indeed contribute to spread such tendency worldwide.

With reference to the geographical spread of applications throughout a national territory, there is a myth to be debunked. Contrary to what many people think, applications are becoming increasingly relevant not only in urban centres, but in rural areas as well. As a matter of fact, inhabitants of the countryside seem to treasure applications even more than city residents. Such programs allow people to easily benefit from several public services, which normally would be available in the cities only, thus offering equal possibilities in the business as in the education field. Applications can hence help reduce social and cultural disadvantages.

In order to offer valid evidence of the effective potential of applications, I will here refer to some programs that can be functional when natural disasters occur. In such situations, apps can indeed help manage the crisis before, during and after the disaster. With these technologies, it is possible to manage aspects of daily life more easily.

2.1. E-agriculture: Fisher Friend Mobile, the importance of technologies to face natural disasters

During humanitarian crises, especially when a natural disaster takes place, one of the first necessities is usually food. The occurrence of natural hazards often causes a real catastrophe for the agriculture of developing countries, making up the 22 per cent of the total losses[37]. This particular issue certainly has a deeply negative impact on the economy and the social life of the affected country, as well as on the health of its people. Tsunamis and storms usually cause damages to fishery and eventually bring drought, thus severely affecting agriculture.

Quite fortunately, several companies are currently trying to create peculiar applications, specifically thought to help the developing countries' populations. Among them, worth a mention is Qualcomm[38] , which has given shape to many projects in India. Their mobile applications have been conceived to be used in different fields, from education to environmental sustainability and health care. The main aim of the company members and is to promote a widespread employment of technology, to improve the economy and the social conditions of developing countries and of the ones in which a solid Internet connection is not yet available. Some of Qualcomm's applications can even work offline, thus allowing more people to use technology to improve their condition.

An example of mobile applications that can be used after a disaster has occurred, that is, to manage the rebuilding phase, is **Fisher Friend Mobile[39]**. The program was first conceived after the devastating tsunami that afflicted India in 2004, to help those rural communities that mainly lived of fishing. The power of the water caused here a real catastrophe, thus making fishing extremely difficult. Fisher Friend Mobile has been thought to provide rural communities and fishermen with detailed weather forecasts and information about the water condition, to help them decide when and where is better to fish. Moreover, the application allows to know the exact position of the user in every moment. In some cases it can be extremely important, for, when the weather is not good and fishermen are out to

[37] Too see further reference on the impact of disasters on agriculture and food security, (FAO,2015), the full document is available at http://www.fao.org/3/a-i5128e.pdf

[38] For more information visit Qualcomm site: https://www.qualcomm.com/

[39] https://www.qualcomm.com/company/wireless-reach/projects/fisher-friend

sea, knowing the exact position can help users communicate and even get rescued. This application too can work offline. When Fisher Friend Mobile was first experienced by 500 fishermen, the results were promising. It had a very good impact on rural communities, and not only in terms of food finding; it brought actual economic benefits. At the moment, the company's aim is to extend the application not only to fishermen, but to farmers as well. The employment of this application could indeed suggest an intelligent way to work and use resources.
India is one of the countries which are most usually affected by natural disasters. It is no surprise then that other applications will be launched here during the next few years, to encourage the institution of an economy based on environmental sustainability. For instance, one of the above-mentioned programs has been conceived to teach people to clean cooking technologies. Combustion indeed produces many toxic elements that are dispersed in the air. **SootSwap** is a project that helps people, teaching them methods to cook in a cleaner way. The project has been realized with the collaboration of Project Surya, which is deeply interested in the reduction of toxic gas emissions. The main aim of the application is, then, to protect the environment and control the climate-change phenomenon, that is, the main cause of natural disasters.

2.2. E-learning: Magic Pencil, a new instrument to educate people

Enablem, an enterprise specialized in technology, first launched this instrument; it was first conceived in Mumbai, India. The **Magic Pencil**[40] is an educational instrument (Brindaa Lakshmi, 2012) that allows children to learn through technology. It is a very important invention, for, after a disaster has occurred, people not only lose public structures such as hospitals, but schools as well. It really is an effective way to encourage children to study, even after a disaster. It is to be said that such application can be successfully employed not during emergencies alone, but also in everyday life. For instance, if a child cannot afford to buy a book, he or she can download it from the Internet. The Magic Pencil is an application for Android and iOS that has been thought to help both teachers

[40] Magic pencil, https://play.google.com/store/apps/details?id=com.enablem.magicpencilstd&hl=it

and students, by improving learning resources and instruments. The Pencil allows to use the E-life tablet, that is, a tablet given to teachers and students through which they can have access to the application.

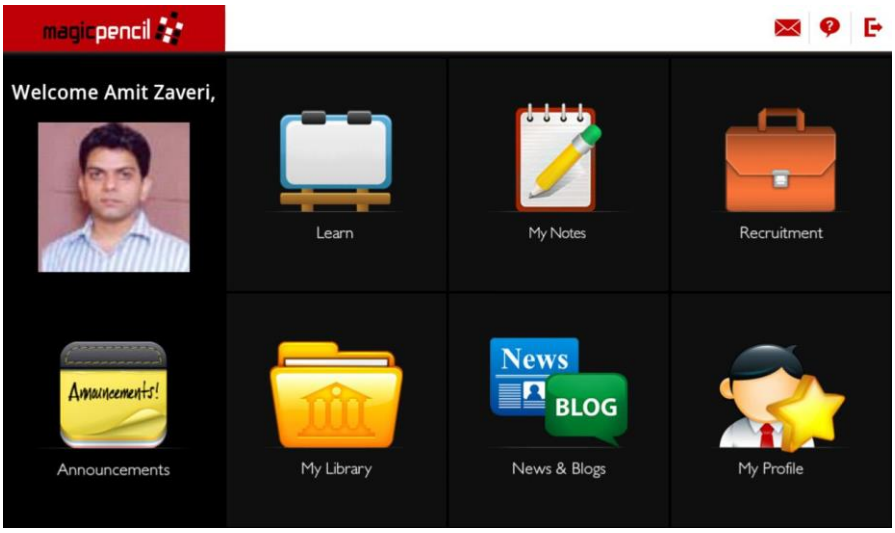


Figure 5. Screenshot of Magic Pencil app[41]

E-life is an application which has been created to train teacher to use the Magic Pencil. It includes different sections in which it is possible to teach and learn different abilities. For instance, the "life skills" section contains lessons about problem solving and decision making, to face critical situations. There is also a section dedicated to communication, which includes lessons dedicated to empathy aspects and interpersonal interactions; these are particularly important for teachers who have to interact with children. There are also simulations about what can happen when you depend only on yourself and your resources. In this program there are different training sessions to teach users how to valorise skills and how to employ them in a productive way. Moreover, the application includes materials and blogs for both teachers and students, dealing with different topics, and online courses. Broadly speaking, E- life is for teachers, while the Magic Pencil is mainly for children. Throughout this application, children can have access to their material and download it anytime. New material is periodically updated, for children to have always something new to learn. The program is also provided with a calculator and a dictionary, along with all the instruments that

[41] http://change-corp.com/apps/elife-tablet-for-teachers/

students need in order to learn and practice. Furthermore, children may take notes, chat, share materials with their classmates, and have access to a digital library provided with audio and visual contents of every type.

The employment of this particular application is important to understand the importance of ICTs literacy. When a humanitarian crisis or a natural disaster takes place, there is devastation everywhere. Students cannot go to school, for, frequently, schools too are damaged or even destroyed.

Wireless connection is essential to connect people who are disconnected from the world, especially as far as educational issues are concerned. In such cases, it is critical to promote the use of technologies, mainly mobile ones, such as tablets and smartphones. Indeed, mobile learning will turn out to be crucial in next few years, also during or after disasters, for it will help the affected people to solve problems and take better decisions. To be precise, mobile learning means:

> "Mobile learning involves the use of mobile technology, either alone or in combination with other information and communication technology (ICT), to enable learning anytime and anywhere. Learning can unfold in a variety of ways: people can use mobile devices to access educational resources, connect with others, or create content, both inside and outside classrooms. Mobile learning also encompasses efforts to support broad educational goals such as the effective administration of school systems and improved communication between schools and families." (UNESCO, n.d.)

In conclusion, the capital importance of the e-learning process during humanitarian crises, especially in developing countries, is to be found in the necessity to replace the structures, such as schools and educational centres, that have been destroyed by the natural disaster. Moreover, applications such as the Magic Pencil will offer children of developing countries the same opportunities of the children of developed countries, in terms of both education and skills.

2.3. E-health: First Aid by Red Cross

Another main field in which technologies can play a crucial role, after a natural disaster or during a humanitarian crisis, is health. The first thing that the affected people must protect is their life and their health. It is for this very reason that, in some cases, technology is incredibly valuable, for it enables people to learn to have access to some services necessary to protect their life.

As it has been often reported, nowadays it is essential to educate people to technology. Indeed, even if the number of health applications keeps increasing, they will be completely ineffective, if users do not know how to employ them. E-health is a term used from the latter part of twentieth century. At this point, technological progress fully involved many different scientific fields of research, including medicine. At present, the main figures investing in the advancement of E-health are:

• United Nations agencies and other international bodies dealing with health, telecommunications and trade;
• Government authorities, health and telecommunication decision-makers at the national and regional levels, as well as the regional bodies to which they belong;
• Academic and research institutions;
• Local health professionals and their associations;
• Consumers, patients and their associations;
• Donors;
• Non-governmental organizations;
• The private sector, including foundations and industries related to health and ICTs;
• The media (ITU, 2008: p.13).

The figures involved in the rescue process during disasters are usually the investors in new applications and technologies. I will here focus my attention on the role of IGOs and United Nation agencies in the field of mobile applications.

One interesting example is to be found in the World Health Organisation (WHO) project.

After the Indonesia tsunami had occurred, WHO invested in new technologies, such as satellites and images, to avoid an epidemic diffusion, to support a better coordination and to prevent further damages. According to "Implementing e-Health in Developing Countries Guidance and Principles", thousands of people were killed in the disaster and many structures were destroyed. There were no hospitals, or any kind of sanitary structures, and medical resources were not sufficient to face the crisis. (ITU, 2008: p.13)

Another important aspect of tragedies such as the 2004 tsunami is that, during natural disasters, everyone can be affected, also nurses and doctors. Hence, there is also a problem of health personnel; during the India tsunami, for instance, 691 people who worked in the sanitary field were declared either missing or dead. In such cases, the authorities had to face both the lack of medical personnel and the previous health issues of the population. It is for this reason that a strategy that involves also the technological aspect can make a crucial difference. Every country, depending on its resources, must plan a health management strategy to be used during crises, either in collaboration with other organisations or partners of the private sector. If we consider the 2004 Indonesia tsunami, some general conclusions about E-health can be made. Let us analyse, for instance, in specific terms, the mobile applications that we can introduce the m-healthy field. Such tendency is spreading in these later years, for there has been an increment in mobile technologies. According to National e-Health Strategy Toolkit, applications can be employed as:

- data collection for surveillance and public health (e.g. outbreak investigation)
- real-time monitoring of an individual’s health
- treatment support, health advice and medication compliance
- health information to practitioners, researchers and patients
- health education and awareness programs
- diagnostic and treatment support, communication for health-care workers. (WHO, ITU, 2012: p.79)

In order to further clarify the concept, let us also define the term "m-health":

> “the Global Observatory for eHealth (GOe) defined m-Health or mobile health as medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices. m-Health involves the use and capitalization on a mobile phone’s core utility of voice and short messaging service (SMS) as well as more complex functionalities and applications including general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology.” (WHO, 2011: p.6)

Finally, more specifically, we can also refer to "E-Health disaster", that is:

> ‘the application of information and e-health technologies in a disaster situation to restore and maintain the health of individuals to their pre-disaster levels’. (ISCRAM 2015, 2015)

This is a specific definition about the use of technologies during natural disasters, in order to encourage a proper crisis management. From the combination of mobile technologies used during natural disasters, we can analyse some useful applications to be employed in such peculiar circumstances.
Red Cross was one of the first IGOs that introduced the use of applications to face natural disasters. It helped creating many applications to be employed before, during and also after natural disasters. A most interesting example of such tendency may be found in a particular application introduced by British Red Cross, called **Fist Aid British Red Cross**[42], available in the Google Play Store. This application can help people, worldwide and in every moment, to be prepared to face a natural disaster. Indeed, it provides assistance to people before a disaster, virtually simulating a hypothetical dangerous situation, and gives instructions about what to do during a catastrophe or, as first aid, if someone has an accident. This application is useful not only during emergency contexts, but also in everyday life, for it helps people in difficult situations.

[42] http://www.redcross.org/get-help/prepare-for-emergencies/mobile-apps

The application has been divided into five sections:

Learn: visual materials that show step by step how to help people who are undergoing a crisis.

Prepare: suggestions and advices about what to do during a common situation of emergency (e.g. street accident, burn). Such instructions can prove effective in an emergency situation too, for these are common accidents that may well happen during natural disasters. During an earthquake, for instance, there can be an accident, during a tsunami you may have to save someone from drowning etc.

Emergency: prompt information required to help a person and guide step by step in the first aid procedure.

Test: tests to verify knowledge of crisis-situation procedures. People may also share the results through social networks.

Info: further information about the Red Cross, its activities, and about the rescue process.

The application is free and can prove to be effective for domestic accidents as well.

The Red Cross launched different applications depending on the emergency, such as hurricanes, floods, earthquake etc. The Hurricane App, for instance, is to be used during and before hurricanes and provides information about the current situation with advices about what people have to do to prevent or to face the situation. This application too sends notifications to warn the people and, thanks to a special “I’m Safe” function, allows to reassure relatives and friends through Facebook, Twitter, via SMS or via e-mail. The application is also connected to the Red Cross First Aid App that gives advices about how you can face a disaster. The Hurricane App is available in Spanish and English and can even work offline. Finally, it shows the precise direction of the hurricane, indicating where it is heading to.

The use of these new applications make us understand how the use of new technologies, especially the use of smartphones is slowly replacing the use of traditional media in every dimension of daily life. This also implies the need to

create programs and initiatives to appropriate dissemination of these technologies. There are many agencies that deal with this. Let's see how and by what means.

3. The evolution of new technologies and guidelines for their effective use

Although the technology is more and more widespread, there are many areas of the world where the reality is different. This is why international organizations and not only are mobilizing with projects and initiatives to implement the use of technologies. In order to understand the general panoramic of the use of technologies and of information sources, it is important to analyse the general situation in different countries. According to the “Measuring the information society Report 2015” we can have a general description of what is happening in the last years about the evolution of technologies and also see what is the program for the next years. This report measures the development of ICT in countries around the world from 2010 to 2015 with the ICT Development Index (IDI). Analysing the report, we can see firstly that in the last five years the use of technologies has increased, especially with the use of mobile telephones. This is one of the reasons why I think it is essential to study mobile telephones and their application within crisis management, because the telephone is an instrument used frequently and in continuous diffusion.

Mobile networks are of greater necessity than fixed networks; they cover 95% of the population and the number of mobile subscriptions quintupled since the 2003 WSIS Conference, as we can see in the diagram. (ITU, 2015: p.2)

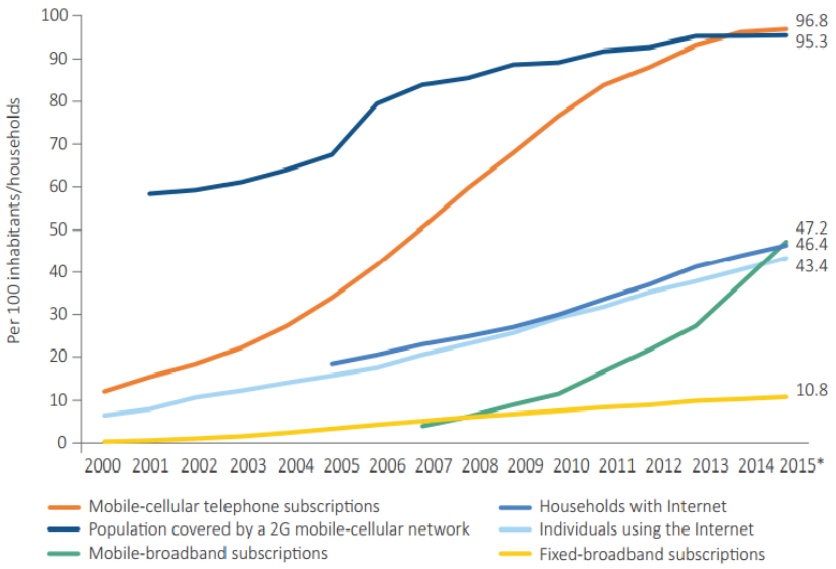


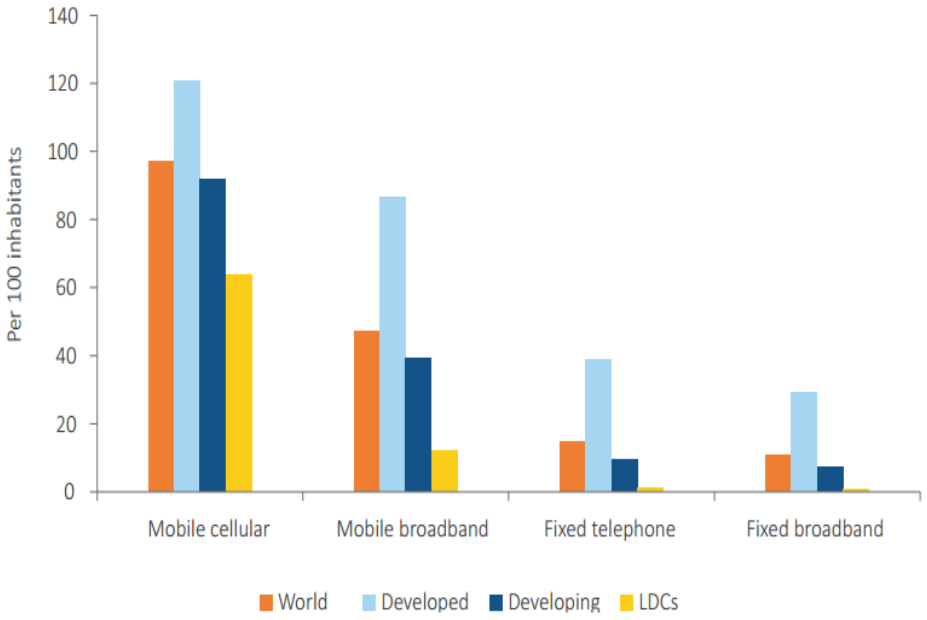
Table 1 Global Changes in major ICTs 2000-2015 (ITU, 2015: p.2)

In orange we can see mobile subscriptions but they don't reflect the exact number of persons owning a mobile because some people can have more than one subscription.

The blue line shows the increase of 2G presence which is, according to ITU, the second generation mobile network and service[43]. As we said is very important to have equipment and infrastructures to run tools, if we do not have a good connection we cannot have good access to the internet and to all the services offered by mobile phones. The green line represents people who use broadband for internet connection and the rest of the lines represent the number of families that have internet, the number of people using internet and the number of fixed network subscriptions.

Notably, the yellow line is one that increases less than the others because mobile tools are more used than fixed networks and pc's. Another relevant graphic that demonstrates the distribution of ICTs in the world is the following:

[43] ITU, Mobile Glossary, 2003, https://www.itu.int/osg/spu/imt-2000/SPU%20Mobile%20Glossary%202003.pdf



Note: *ITU estimates; numbers refer to subscriptions.
Source: ITU.

Table 2. ICT access by development status, 2015 (ITU, 2015)

This graphic represents the distribution of mobile phones and mobile internet broadband compared to fixed telephones and fixed internet networks. On analysing this graphic, it is possible to make a comparison between developed, developing countries and least developed countries[44]. Analysing data, the digital divide is very clear, in fact developed countries are more advanced in every technological compared to all other countries.

Collaborating with other organisations and institutions, ITU has created the Connect 2020 Agenda[45] which is a development program for the use of technologies and for the access of information. Organisations decide some goals to reach within 2020 in order to create a more interconnected world and this contributes to implement the social and economic growth of developing countries. Internet access is also an important factor to improve the quality of people's life (ITU, n.d.).

[44] The full list is available at the site: http://www.un.org/en/development/desa/policy/cdp/ldc/ldc_list.pdf

[45] ITU, Connect 2020 Agenda, http://www.itu.int/en/connect2020/Pages/default.aspx accessed on 1st August 2016

This agenda is important in understanding what kind of work organisations are doing and what are the main objectives to achieve in the next years.
The main goals for 2020 are:

• Growth – enabling and fostering access to and increased use of ICTs.
• Inclusiveness – bridging the digital divide and providing broadband for all.
• Sustainability – managing challenges resulting from ICT development.
• Innovation and partnership – leading, improving and adapting the ever-changing technology environment. (ITU, 2015: p.5)

All these aspects are very relevant to understanding how technology and information access can help in emergency cases and in improving everyday life. However, it is true that in developing countries there are more important problems to solve than digital divide or information access. Developing countries are still fighting against hunger and disease, so the technology's development is perceived as something less relevant compared to other problems.
Now I would to explain in a more detailed way these four points to better understand their implications. If we understand the benefits of their implementation it will be easier to understand why they can be so important during a crisis situation.

3.1. Growth – enabling and fostering access to and increased use of ICTs.

This point is focused in increasing access and in implementing infrastructures. The main goal is to promote and enlarge the number of people who use internet and new information and communication technologies. In order to monitoring the access and study the evolution of this aspect ITU uses two different way of measure. To monitor different targets that use ICTs, they adopt the same parameter adopted by WSIS (ITU, 2011). To measure broadband they use the same parameter used by Broadband Commission for Digital Development[46]. The three targets that are taken into account are:

- families who have to be access to internet: by 2020 they should be 55% of the population.

[46] http://www.broadbandcommission.org/Pages/default.aspx accessed on 1st august 2016

- People who will use internet: by 2020 they should be 60% of the population, and
- affordability of ICTs, that in 2020 should arrive to 40%.

This growth will affect other fields such as health and education. It will increase the production of new instruments and the liberalization of the ICT'S market. It will reduces technologies' prices and it will allow a large number of people to have access to ICTs.

3.2. Inclusiveness – bridging the digital divide and providing broadband for all

This point focuses the attention on the inclusion of communities in the use of ICTs especially individuals with disabilities, women, children and indigenous people. Another focal point is to promote the education in the use of ICTs. The goal of Agenda 2020 is to create a good connection in rural areas. In this case is essential the partnership with private sector and governments. They must promote the use of technologies building places where people, who don't have computers in their home or in their countries, can go to use internet. They must promote the education in the use of internet. Institutions must support initiatives that include the technologies implementation in the field of education, government and health. All this to promote equal opportunities for all the population. When we talk about accessibility we are also talking about the use of television, and radio, not only about the use of internet.

3.3. Sustainability – managing challenges resulting from ICT development

This point focuses on environmental protection creating a sustainable improvement of technologies and taking care about cybersecurity especially for children and women. According to the definition of ITU cybersecurity is:

> "the collection of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices,

assurance and technologies that can be used to protect the cyber environment and organization and user's assets."[47]

This point pays attention to an important reality: it is true that technologies can help people and save lives. Many things become easier with the use of technologies, but they can hide threats especially for people who are unfamiliar with ICTs. There is also the problem of the privacy. With the diffusion of social networks and internet, privacy is threatened. The collection of big data is important for both the public and private companies. With data sharing they can exchange information about their customers, but at the same time it can be consider a infringiment of privacy by the latter. This is the reason why the law about this theme is everyday more careful about this problem. Countries have to made laws according to their needs and their law system, but paying attention to some aspects that are considered valid at international level as the protection of privacy.

3.4. Innovation and partnership – leading, improving and adapting to the changing technology environment

There are different actors involved to implement and foster the use of internet: private companies, authorities, institutions and organisations. They have to communicate each other and create standards. As we said before, ITU members want to modify the legislation in order to safeguard people and children's privacy to guarantee more protection. In order to reach this goal the collaboration between organisations and institutions is fundamental. The collaboration between educational and private sector is also important in order to foster the research on ICTs and to attract firms that want to invest on this field. The collaboration of different subjects at local, but also at regional, national and international level promotes the exchange of ideas and improves the technological development.

[47] ITU, Cybersecurity, http://www.itu.int/en/ITU-T/studygroups/com17/Pages/cybersecurity.aspx accessed on 1st August 2016

The development of technology implies many threats (especially digital divide and cybersecurity), but now we will see why technological developments are so important, also in developing countries; and what are the benefits in everyday life and during emergencies.

3.5. "Measuring the Information Society Report", the evolution of technology in the later years and its inner potential

In order to better comprehend the current state and the possible improvements of information and technology accessibility, the ITU has organized a "World Summit on the Information Society" (WSIS), in collaboration with other UN agencies. The first edition of the event took place in 2003, in Geneva, while the second edition was held two years later, in Tunis[48]. Such summit is remarkably important, for it monitors the evolution of information and technology accessibility. This particular matter is closely related to what it has been previously stated in the essay, for both information and technology play a capital role during disasters. Indeed, they provide useful information about how people should or should not behave in case of emergency. It is for this main reason that the inner potential of information has been frequently associated with the spread of technology. Technology offers new means of gathering information in faster and cheaper ways.

In 2003, the organisations involved in the summit identified some principles necessary to further analyse the general state of information accessibility worldwide. It is my opinion that such principles are fundamental to better understand the basis and the background of the current role of information and technology.

In the following paragraph, I am going to depict the action lines of the WSIS; they summarize the most significant characteristics of efficient communication. If we are capable of perceiving how information accessibility can have a positive effect on our lives, we may also understand how the progress of technology can make a difference, especially in developing countries and during humanitarian crises. In its program, WSIS underlines every trait of good communication, with guide

[48] WSIS, http://www.itu.int/net/wsis/basic/background.html accessed on 26th July 2016

lines that should be followed not only by the media, or during humanitarian crises, but in everyday life as well.

The WSIS action lines consist of eleven points:

- **C1. The role of public governance authorities and all stakeholders in the promotion of ICTs for development**

Such specific aspect is based on the promotion of ICT's implementation on a local, national and international level. It has been designed to involve authorities, organisations and the private sector, and to encourage a partnership between these subjects. It promotes the dialogue between stakeholders, with the aim of improving the information-exchange process and the creation of common strategies. Furthermore, it encourages potential investors to support the production of ICTs. This is a critical point, for it shows how institutions can have a positive impact on the implementation of technologies. It also underlines the importance of partnerships and collaborations between different sectors, such as private and public, thus sharing the various resources they have. (WSIS, 2003)

- **C2. Information and communication infrastructures**

The high importance of the infrastructure matter is closely linked to another question, that is, Internet accessibility. For instance, if we want to log in to Facebook or Twitter, we need both an instrument (a personal computer or a smartphone) and an infrastructure (an Internet connection). Such process is applicable to other information sources. For example, if I want to watch the latest news, I need an instrument (television), but I also need a connection and a physical infrastructure that allows me to have the signal. As previously stated in the first chapter, during emergencies there can be a bad reception, so it is important to reinforce infrastructures. The presence and effectiveness of infrastructures is particularly valuable to marginalize countries because they require a good connection to the larger cities in order to require help. Creating connections and infrastructures in schools, universities, libraries, hospitals and in public spaces is a key factor of such process. Moreover, special attention must be given to both disabled and aged people, for their being the weakest categories of our society. They need an educational system that allows them to get involved in the information-exchange process. Of equal importance is promoting the

development of technologies that use of a graphic interface to help illiterate people. Another critical point is to guarantee a remote connection, so that isolated countries may connect to the Internet and other information sources. Finally, another remarkable aspect can be found in the promotion of the use of traditional media, to create standards on a local, regional and national level. Thus, there would be an improvement in the efficacy of the communication network and in the circulation of news and information worldwide. (WSIS, 2003)

- **C3. Access to information and knowledge**

This point focuses on how and why information accessibility should be free. It is the governments' duty to promote the spread of public data and to guarantee a free access to public information, in its every aspect. Authorities must create information points, thus allowing all the citizens to be involved in the information-gathering process. A possible initiative could be, for instance, installing computers with an Internet connection in public places, such as libraries and schools. Moreover, governments must encourage the spread of open sources to facilitate a wider access to knowledge. Creating digital libraries connected on an international level (“hybrid libraries”) may contribute to the effectiveness of this process (WSIS, 2003). In conclusion, Internet accessibility must be both a free and an easy instrument.

- **C4. Capacity building**

The capacity building approach aims to spread and strengthen the skills necessary to gather information in the era of technology. The process consists in providing an ICT education, thus fighting against illiteracy worldwide. It is necessary to improve managerial competences also in the world of work, instructing people in the use of new technologies. Another relevant aspect may be found in providing an education valid for all categories, that is, aged people, adults and new generations. Specific courses may be held to help disadvantaged groups. Furthermore, women are here given a special kind of attention. According to the Information Society, it is fundamental to eliminate gender barriers. Organisations have to promote a ICTs educational program which reflects the world of the business, thus creating specific work skills. It may be also possible to improve technology education through self-learning programmes, to teach

people even how to use a remote connection. Such education plan should also include those technologies that can prove useful during natural disasters, especially in the rebuilding phase.

- **C5. Building confidence and security in the use of ICTs**

This special point focuses on the promotion of security in the use of technology devices. With the spread of ICTs, the number of violations has increased, for people are not able to recognize the threats that may arise when they surf on Internet or use social networks. This is especially true if the user is young. It is for this very reason that governments and authorities must be alert and thus adopt an education policy; it is their duty to spread a general awareness on the Internet's potential dangers as it is illustrated in “The quest for Cyber security”. (ITU, 2014)

Ever since the Internet was been created, people’s privacy has been drastically reduced. Everyone can gather information about other people's lives, in every moment, and without anyone's consent. Such accessibility can prove to be extremely dangerous. During emergencies, for instance, mean people can benefit from the current situation of chaos to plan crimes.

- **C6. Enabling environment**

In this action line, the main focus is to be found on the authorities and governments’ transparency. These subjects being part of the Information Society, they must co-operate with one another, creating a good interdependency among institutions. Such cooperation mainly consists in creating standards and transparency. Governments must propagate a certain degree of awareness on the importance of the Internet, thus encouraging information and Internet accessibility. Authorities try to enhance interconnection on an international level, encouraging an international domain and creating virtual communities. Here, people can exchange advices about their experiences, and create groups of support for the implementation of the use of the Internet. The use of ICTs is also essential to foster the economy; it is for this reason that institutions must also enhance the E-commerce.

Transparency is a crucial matter in the field of technology, especially as far as the public administration is concerned. Indeed, it is the fist force that intervenes if a

natural disaster or a humanitarian crisis occurs. In such cases, transparency is fundamental to spread confidence among the people and provide them with clear information and instruction about what they have to do and what the available services are.

- **C7. ICT Applications**

As previously stated in the essay, nowadays technology has an effect on every aspect of our lives; one of the main goals of the Information Society is to create awareness on this particular matter.

If people know the benefits of this service, they will use it in a more efficient way. Indeed, there are several aspects of everyday life that can significantly improve thanks to technology and to the Internet. One of them is the E-government. It consists in the use of the Internet to improve the transparency in public administration. It may be prove also important to consolidate the relation with the citizens and to implement their activities and their interest in public matters. E-business, on the contrary, is centred on the promotion of E-commerce and global economy exchange**s** on international levels. It also aims to increase the number of partnerships between the public and private sector and to promote the spread of the E-commerce, especially in developing countries.

E-learning is an aspect related to ICTs education for aged people, children and disadvantaged groups of people who do not have the resources to learn the use of Internet by themselves.

Another field of society that has been positively influenced by web resources is health. This is a relevant dimension in this essay, for technologies can be crucial during a crisis to help people and save lives. It for this reason also that it is necessary to promote wide e-health accessibility. Governments and institutions, along with other partners, must cooperate with humanitarian organisations to conceive an easier and more efficient sanitary system, also through technology. They must create standards to spread health data, thus making a difference in crisis situations, especially if are different organisations and different culture are involved. E-health, in conclusion, can spread a prevention policy in developing countries.

Another relevant factor is to be found in the world of work. Computers can be used to work and telework, thus enabling women and even disabled people to work.

Technology can also have a positive impact on the environment. In this case, we talk about E-environment, which consists in the promotion of technologies to foster the use of natural resources and protect the environment. As we will see later in the essay, such mean can prove to be extremely effective during humanitarian crises, when natural resources are insufficient. Technologies are also important in agriculture, especially if governments encourage the creations of partnerships between the private and the public sector.

- **C8. Cultural diversity and identity, linguistic diversity and local content**

The cultural dimension is central for, as previously stated, it is essential to respect different cultures, especially during situation of crisis, when people are generally more sensitive and it is necessary to understand their needs. Organisations which help during emergencies must take account of cultural differences. Technology can offer a wide awareness on different realities and cultures, in thus helping to reduce cultural gaps and, furthermore, prize differences[49]. In this peculiar context, information and technology play a main role in providing users with a proper translation system. Organisations can help the local media with the support of new media, respecting the local culture and language while not isolating rural areas. It is important to help natives to elaborate contents in their own language. The Internet, in this field, gives a significant contribution, for it enables people living in isolated areas to share their experiences with the rest of the world. It is thanks to Internet that local communities can visit and know other cultures, though in a virtual way.

- **C9. Media**

One of the major purposes of the WSIS is the implementation of the media functions that are essential in communication. Media define the agenda setting; therefore, they decide what is important and what people have to know.

[49] UNESCO, UNESCO's Universal Declaration on Cultural Diversity available at the link http://unesdoc.unesco.org/images/0012/001271/127162e.pdf

In order to offer free, clear and transparent information sources, WSIS wants to reinforce the role of the media. They must be independent from lobbies and policies, while being free or at least low cost. Indeed, a major advantage of the spread of web resources is enabling the wider public to gather information at a low price. Another aspect related the cost of information is its plurality; a larger amount of information is most likely to bring transparency, impartiality and completeness to the process. There are different aspects of plurality that are remarkable, such as the employment of different devices to gather information, but also the different perspectives used to describe facts. It is for such reasons that the main aim of the Information Society is to involve the greatest media of the developed countries in training media of developing countries. Such educational process should guarantee an equal representation of women and men and further support the implementation of infrastructure and technologies, especially in developing countries. Hence, it would be possible to broadcast information even in rural areas, and, as a consequence, construct a more proper and widespread information system.

- **C10. Ethical dimensions of the Information Society**

Promoting primary values and principles, such as freedom, equality, respect for nature and solidarity, is a most distinctive trait of information. Indeed, one of the main objectives of the Information Society today, is to prevent the diffusion of brutal and aggressive messages. Hence, the media must sensitize people towards the respect of the primary human values. Effective strategies could be found in the reduction of messages of violence, especially against women, racism, xenophobia and other potentially dangerous and anti-educational behaviours.

- **C11. International and regional cooperation[50]**

The international cooperation has a capital importance as a structure, for, through it, developed countries can guide developing countries in the implementation of their media and information spread.

WSIS is an international, thus involving many cultures. Being aware that people think differently, have various perspectives and belong to many cultures, is an

[50] WSIS, http://www.itu.int/net/wsis/implementation/ accessed on 26 July 2016

essential feature in this process. It enables the operators to intervene on a local level, respecting the cultural dimension of the population, and, moreover, enriching the cultural perspective of the others.

There are several follow ups to that process, which are guiding and accompanying current technological developments at the supranational level[51]. Yet all the above-mentioned points are to be considered as extremely valuable. Internet access enables the users to be autonomous in the information-seeking process, while, at the same time, it detects possible threats. This is the reason why organisations continue to encourage the spread of technology and the freedom of information, also investing in cyber education[52], especially for weaker categories. These organizations promote and invest in the dissemination of the good use of the new technologies, but also in the implementation and production of new technologies for crisis management during natural disasters.

4. The role of organisations and agencies in the creation and use of mobile apps

Organizations involved in crisis management are also involved in the search for new tools to deal with these crisis situations. Indeed, they are active actors in the development of new tools to improve their work. As previously discussed, there are apps that are financed by privates or organisations and conceived for everyday life, and apps used by organisations to manage crises.

In the last case, applications are employed as internal-communication tools. Indeed, smartphones are important tools, for when there is no electricity they have their own battery supply, and they can work even without an Internet connection.

If we deal with the use of mobile apps for internal communications, we may find some interesting programs to analyse. One of these is **Humanitarian Kiosk**[53]:

[51] ITU, http://www.itu.int/net/wsis/implementation/2014/forum/ and WSIS+10, https://publicadministration.un.org/wsis10/

[52] Cyber education project, http://www.cybereducationproject.org/ accessed on 2nd August 2016

[53] Humanitarian Kiosk, https://www.humanitarianresponse.info/en/applications/kiosk, accessed on 9th August 2016

this application is used by UN agencies to help operators during their work. It registers information about all locations where UNOCHA operates. Here, users can select the place in which they are interested in, and automatically they receive every document and information about what is currently happening in that place. Unlike other applications, this one has not been provided with a GPS localisation.

Figure 6. Screen of Humanitarian Kiosk App

The application enables operators to get their resources offline, and to communicate with other operators, thus sharing information. As a consequence, people can transmit data and documents from different parts of the world to other operators who are involved in the same mission, even if they are not physically in the same place. Information travels from the top to the button and vice versa, from managers to operators and from operators to managers. This application is for internal communication among operators, but it can be also useful for donors who decide on possible investments, and for people affected by an emergency, allowing them to analyse the situation through data and better understand its seriousness (OCHA, 2016). This application was first projected because, during a disaster, the first phase of response was managed by the OCHA, who physically built a kiosk from which it provide information. This app is important to communicate with people who have not already arrived in a place or people that

manage the situation from another place. They both need this tool to communicate in an effective way.

There are different formats of documents, which can be opened in different ways (e.g. via e-mail, SMS, QRCode, or with Facebook and Twitter). There are different formats for the files, such as Adobe Acrobat (.pdf), Audio (.m4a and .mp3) Images (.jpg and .png), Geographic (.kml) with internet connection, Microsoft Office Documents (.doc, .ppt, and .XLS), Text files (.txt), Web Pages and Video (.mp4, .avi, .mov and .mpg)[54]. There are also different sections as contacts, videos and visual materials, events reports and data, such as the number of casualties, injured etc. In these sections the user can create different subsections and personalise them, saving the files in the order they prefer[55].

Another interesting application is **Fema mobile app**[56] , generally used by common people. It is, therefore, more employed by people affected by natural disasters, than by the ones who manage the situation. The application is available in all app stores. It was launched by the Federal Emergency Management Agency (FEMA), and it is connected to the National Weather Service of the United States. Hence, it can report only about facts that happen in the United States. In this app there is a section where there are useful tips about what has to be done in case of emergency. The app is available in English and Spanish and it is divided in different sections. It also serves as a platform, to share photos of the disaster and help operators.

[54] H.Kiosk - Management Guidance, https://docs.google.com/document/d/12Xzx-BtlbFQmTWUaCQU92ldOqbpYR9IHimqVR34suxc/edit, accessed on 9th August 2016

[55] *ibidem*

[56] For more information visit: https://www.fema.gov/mobile-app

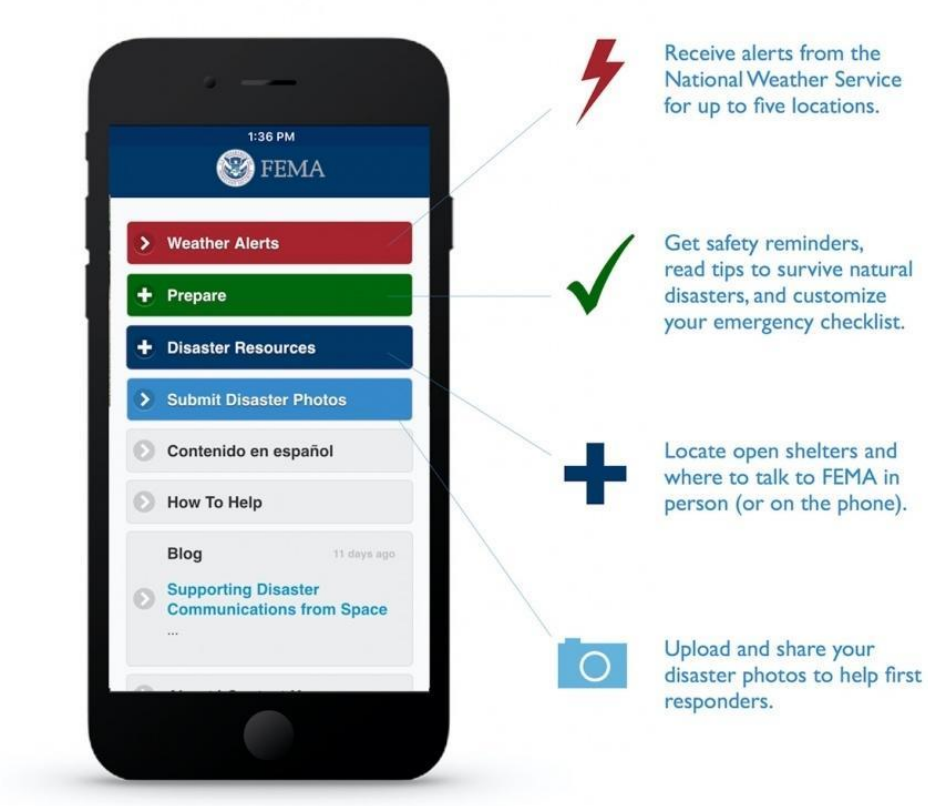


Figure 7. Screen of FEMA app

Using a smartphone is most effective, for its camera allows to take photos and share videos and visual content, thus becoming a reporter. The user-generated content is an increasingly-spread phenomenon, as the number of mobile devices increases day by day, and people produce more audio-visual contents. For instance, in the "Disaster Reports" sections there is a list of disasters with related pictures, type of emergency, date and place of the disaster. This app offers suggestions about what is to be done before, during and after natural disasters, connecting people who use the app directly to FEMA when they need help. The program is also provided with a special alert system.

Show me for emergencies[57] is an app made by Executive Office of Health and Human Services, introduced to help people with issues and disabilities, or, more generally, to help people who have difficulties communicating because they do not know English (which is considered a *lingua franca*). The program has been

[57] http://www.mass.gov/eohhs/gov/departments/dph/programs/emergency-prep/additional-access-needs/show-me.html

created to communicate in a two-way mode of communication. It is based on an icon system, to be easy to understand and to use. This app has different icons depending on what they means and the instructions they want to provide.

This application can also work offline or without a good reception, so it can prove to be crucial during an emergency. Moreover, it is valuable for it overcomes the barrier of literacy, thus enabling people who are either not familiar with technology, or people who live in rural areas and speak their local language only, to use this instrument.

This kind of technology can help people to face the digital divide problem in a more functional way, helping workers and operators to perform their activities and tasks with fewer problems. This application, hence, is very useful for both operators and afflicted people, for illiterates are able communicate and operators to understand without any further difficulty. But there is another subject that cooperates and finance the diffusion of technologies to manage and improve crisis management. This is the private sector.

5. Public and private sector, partnership in crisis management

As previously argued in the essay, IGOs are not the only active organisations to manage crises in case of natural disasters. Indeed, the private sector plays an equally important role, for it can finance organisations and provide them with specific instruments to face disasters. Let us reflect upon this tendency. Why do firms donate money to help organisations during humanitarian crises? What advantages do obtain? According to a report entitled “Stimulating private sector engagement and investment in building disaster resilience and climate change adaptation”, written by Price Waterhouse Coopers, the private sector is deeply interested in investing in countries affected by a disaster for a number of specific reasons. The private sector is the most important factor of economic growth, and during a crisis it is exposed to the dramatic event, because the first thing to be damaged is economy. (PWC, 2013: p.29)

The private sector helps communities during natural disasters, especially if they are located in those places in which economy needs to be restored. It also strives to consolidate its relationship with local people. Indeed, it is very important for a

firm to establish a good relation with the local communities. Moreover, an enterprise can offer work, thus contributing to restore the economic and social condition of an affected community, that is, helping those people to rebuilt their countries. In this case, the private sector also gains in terms of corporate social responsibility (CSR). This peculiar aspect refers to companies taking responsibility for their impact on society, bringing benefits to risk management, cost savings, access to capital, customer relationships, and human resource management.[58]

But what gains do firms and enterprises may have, if they decide to help the population of an area in which they do not have reason to make business?

International brands, which have a worldwide business network, engage in philanthropic campaigns to improve their reputation. Several firms adopt this action line, having understood that corporate social responsibility is not exclusively based on what the firm produces, or on the economic profit. It is also the result of how they deal with humanitarian and social aspects, and how they influence this particular field. We must here make a distinction between two different types of private organisations, which regularly take action during natural hazards: profit and non-profit organisations.

Firms are specialised in the production of some particular services. They have tools and instruments to help people offering these services at a lower cost. They can directly offer their assistance, bringing all those materials, tools and devices or goods needed to rebuild. In some cases, they can also cooperate with other humanitarian organisations directly involved in helping afflicted countries.

Many examples of such reality can be found worldwide, and in later years this trend has increased. In order to offer further evidence of such tendency, I would like to analyse some cases, which clearly show the importance of this topic and the importance of the virtuous relationship between organisations and the private sector. First, however, it has to be stated that, according to the public opinion, the private sector makes its own interests without taking into account the people's well-being. Nevertheless, economy teaches us that this is not completely true, for, in order to have good profits, an enterprise must set its affairs in a good place,

[58] http://ec.europa.eu/growth/industry/corporate-social-responsibility_en

with a good economy. I will focus only on multinationals involved in ICTs, to show how the private sector can implement communication, offering its skills, knowledge and technologies.

5.1. Ericsson collaboration with IGOs

Ericsson is a company that works in the field of communication technology. In 2000, it started a program of collaboration with some IGOs, such as UNOCHA, WFP and UNICEF, to help these organisations during natural disasters. The program is called "**Ericsson Response**[59]". In this project a lot of operators and volunteers are involved, each of them offering different skills. This is an important point because in big company like Ericsson employees have a great variety of competences, so a large concentration of human resources can be successfully concentrated to face a disaster and solve problems.

Ericsson, like other companies, is specialised in the production of information and communication technologies. According to a document of Ericsson Press backgrounder of 2016, the "Ericsson Response" initiative has helped 30 countries in fifteen years, in 40 different circumstances. This initiative involves 140 volunteers who work for the company, who have been specifically trained to improve and increase communication. This statistic is quite relevant; it gives us the idea of the importance Ericsson volunteers have had during disasters. Indeed, they are specialised in providing instruments to re-establish communication networks during humanitarian rescues. In the Nepal earthquake, in 2015, they worked to provide communication and connection services to operators. They brought relief on many other occasions. In 2000, they helped during the floods in Algeria and during the drought in Tajikistan. In 2001, they rescued the Hungarian community during a flood and they intervened in earthquakes in Pakistan, Peru and El Salvador.

In 2002, they intervened in a rail disaster in Tanzania and during food crisis in Lesotho. They also brought humanitarian aid to Afghanistan.

[59] Ericsson Response, https://www.ericsson.com/ericssonresponse

In 2003, they helped the population affected by the earthquakes in Algeria and Iran, and during an hurricane in the Caribbean. They also brought their aid to Liberia.
In 2004, they worked in Indonesia and Sri Lanka after the tsunami and, in 2005, in Pakistan after the earthquake.
In 2006, they gave ICT support to aid workers in South Sudan and to help the population of Pakistan, affected by an earthquake.
Other important initiatives were organised in 2009, when they given ICT support to the Philippines and the Democratic Republic of CoIGO. They were also part of the rescue team in the Haiti earthquake in 2010, and in 2015, they helped the Nepal population after the earthquake and the cyclone in Vanuatu.

Communication is a key factor to coordinate resources in an affected area. People, especially operators, need to communicate in a promptly way. For this main reason Ericsson's collaboration is very important, because it provides a country with all that is necessary to re-establish a good communication, thus working better.
Taking into consideration the Haiti earthquake in 2010, we can analyse what the company made and, in more specific terms, what kind of tools they gave to operators. In this occasion, 18 volunteers worked to re-establish the communication in the country. They worked to support organisations as UNIEF, OCHA, WFP and they operated for six months. Afterwards, they worked in collaboration with Global System for Mobile Communications (GSM) to re-establish reception.
To give an idea of what was done, we can read these data given by Ericsson press backgrounder in 2011:

> “The effort was one of the biggest in the history of the initiative so far, with 18 volunteers working in shifts for six months to cover communication in the 40 sq km area, incorporating the capital Port-au-Prince. An average of 3000 calls was made every day by the aid workers on the ground.” (Ericsson, 2011: p. 1)

Their importance is so relevant during these crises not only for the affected people and humanitarian operators, but also for them, as it has been reported in an interview made to Brent Carbno, the program director of Ericsson Response by UNICEF. In the interview he said that working with organisations is crucial in order to have a good impact on a large number of people. This could probably mean that Ericsson wants to implement its work in humanitarian aid in collaboration with IGOs that are specialised in the sector. They do not wish to work only on a large scale, but to bring help to smaller, less important populations as well. During natural disaster in Haiti, Ericsson Response also worked with UNICEF, to reach and help children.

As previously mentioned, Ericsson intervened in other circumstances, for example after the Nepal earthquake, which occurred five years later than Haiti. In this case, Ericsson worked in collaboration with telecommunication clusters, supporting not only organisations, but also doctors, fire-fighters and hikers.

Ericsson response is but one of the many projects that are involved in the humanitarian help system. Indeed, other companies are interested in offer their resources to help affected people.

According to a report draft during Aid and International Development Forum (AIDF) global disaster relief summit, in a panel discussion about the use of technologies, there are illustrated the advantages given by Ericsson Response project. Ericsson with its work gives a useful contribution during disasters. Working in collaboration with Emergency Telecommunications Cluster (ETC) it developed 'WIDER', that is a solution to provide a secure network access and it gives the possibility to monitoring internet access. Ericsson collaborates also with WFP in the implementation of this tool.

These kinds of collaboration are useful also to implement the use of some new technologies in different fields. Private sector offers tools and instruments free to organisations that test these instruments for the first time.

The collaboration between aid organisations and private sector is not always virtuous. In some cases the private sector first offers some services to organisations for free, and after requires a payment. In this case it is very important to invest in understanding what organisations and especially private

sector want from this collaboration, in order to be clear and to have a good relation without misunderstandings.

5.2. The role of CISCO during humanitarian crises

Another IT company that collaborates with IGOs is CISCO. US Chamber of commerce published an interesting report that illustrates the role of private sector in crisis management and their collaboration with aid organisations. In this report, different important companies have been identified, which are known on a global level and involved in aid process.

CISCO works in the humanitarian help field since 2004. After the September 11th attacks and the 2004 Indian Ocean tsunami, they establish Cisco Corporate Social Responsibility (CSR) program that is a program to respond to emergency crises in collaboration with FEMA.

This collaboration is fundamental and very interesting to analyse because it illustrates in a practical way why communication and ICTs are so important in crises management.

> "Any significant disaster creates a tremendous need for communications and interoperability between response agencies, including government and intergovernmental organizations (IGOs), the military and other organizations working to support an affected community. The immediate need for Internet access, including email, chat, videoconferencing, social media and any number of other applications, means that computing and communications technology are expected in any successful response."(U.S. Business Chamber, BCLC, 2012: p. 30)

CISCO established a team specialised and trained in face these situations: Cisco Tactical Operations team (TacOps). It started to work in 2005 during Hurricane Katrina and it worked also during other disasters such as Haiti, Japan, New Zealand, Australia, and Pakistan. CISCO supports operators not only with a team of experts, but also with very useful devices such as the Network Emergency Response Vehicle (NERV). It is a mobile communication centre that allows

operators to communicate in emergencies situations. This instrument is ready within 15 minutes and it has autonomy of 4 days[60]. To better understand the benefits of TacOps' work we can analyse the case of Typhoon Haiyan in the Philippines happened in 2013. TacOps with the Disaster Incident Response Team (DIRT) intervened after the disaster because thypoon destroyed cellular towers making communication impossible. They intervened within four days and they re-established communication through a system of Voice Over Internet Protocol (VoIP) with a special communication kit and a satellite that provided also internet access to aid organisations. They also established different bases to coordinate the works and thanks these technologies they have been able to find familiar of displaced people. Now the team is composed by 9 full time engineers that are involved in rescue operations United States, China, the United Kingdom, Ireland, and Brazil. These kinds of intervention are advantageous both for companies and afflicted countries. In this specific case of the Philippines, for example, the Emergency Communication Tool kit was given to the communication group of the Philippines Army. Soldiers were trained in order to use it. On the other side, the company had a chance to try this technology and to get new ideas to enhance it in view of new emergencies.

5.3. IBM and its contribute during natural disasters

Also IBM is involved in support aid organisations during natural hazards. It started helping Japan communities uring natural disasters thanks the collaboration of its employees and then it was established a formal structure that helps during disasters. They collaborate opening their data to universities as they made during Japan earthquake to Hiroshima University. They also use their data centre to host IBM smart Cloud to allow organisations to better communicate.

They also helped during earthquake in Nepal creating technologies to collect in a more efficient way data about afflicted persons and border afflicted communities; offering specific technologies useful for Nepalese government. (IBM, 2016: p. 22)

[60] For more information about Cisco work: http://www.cisco.com/c/en/us/about/supplier-sustainability/tactical-operations-tacops.html#

They do not help only providing technologies but also providing food and medicines as they made in India during the flood in Chennai. IBMers used their platform and technologies to share the need of community. They create and donate a cloud system called IBM Intelligent Operations Center for Emergency Management. This system is a good solution for crisis management. It is used to create a common operating picture about the general situation. It integrates and unifies information about the emergency, and it is useful to analyse the situation and take decisions in shorter times. Through IBM Bluemix that is an open source platform users can collaborate to implement new services and share ideas to implement technologies and new tools for emergency management. This contribute is very important because common people and users can add important information, such as maps or photos, that enrich databases with useful information. Everyone is invited to give his or her aid and share his or her knowledge with other users. Studying this kind of collaboration trough users we can appreciate a different approach to disaster response. It is becoming everyday more focused on citizens. This is the reason why it is everyday more important to teach people how to use technologies, and the importance of information access through them. Indeed, IBM is involved not only in implementing new kinds of technologies useful for emergency response, but also to emergency preparedness. It thinks that technology can be useful, but it can also prove to be important to give tools and a technological education to people. Their help, however, goes beyond providing new technologies.

> “Some of our long-term relief efforts during 2011 culminated, as they often do, with a donation to local schools of the IBM KidSmart Early Learning program, which includes computers, software, furniture and teacher training to help children learn and explore concepts in math, science, language, and teamwork. We translated into Japanese two guides helping aid workers recognize and respond to the signs of trauma in children and adults affected by the disaster. We also offer legal, marketing, personnel and contractual templates, forms, and materials to help small businesses prosper”. (U.S. Business Chamber, BCLC, 2012: p. 33)

IBM takes into consideration the problem of digital divide talking about Indian communities. As we know is not possible to definitely eliminate digital divide, but is possible to make some operations that can be useful for an effective emergency management. For instance, it may be possible to create simple platforms to encourage vulnerable populations to use technology. Other resources could also be the creation an app store accessible to vulnerable communities and the improvement of communication network. That said, all these applications and systems have to be adaptable to smartphone.

The use of these new technologies, however, require a reflection on the social implications that flow from it and the main problem that comes from them: the digital divide.

6. The problem of digital divide

As mentioned before, technology provides better communication, they are used by organisations and by people who work during humanitarian emergencies, but they can be useful also for disaster-affected populations.

When we talk about digital divide we are talking about the disparity in the access to information and communication technologies. Digitalisation and introduction of new technologies in the market produce a gap between people who can have access to those technologies and people who cannot. It is very difficult to define this problem because there are several different criteria to measure the digital divide. For instance, it may be useful to focus on different aspects such as network access, human capabilities, knowledge and application, IT usage in expertise, IT usage in business sector, also the way in which the technological disparity is reckoned can vary in different perspectives (C. M. Cho , 2004). According to Cho, we can talk about two different types of digital divide. The first one is **vertical;** it generates a problem of equal opportunities between IT users and non-users. The second one is a **horizontal** divide among IT users depending on their competences that generates problems of social integration (C. M. Cho , 2004).

I am very interested in the first level because is the main factor that creates important different ways to approach a humanitarian crisis. Usually countries stricken by natural disasters are developing countries, in which technology is not easily accessible. Indeed, they may not have such tools and devices or, if they do have them, they are not able to use them. Thus, organisations do not only take action in the reconstruction phase of a disaster, but they must reduce the digital divide. By doing so, they will implement the efficacy of the intervention, also because technologies can be used to reduce damages during humanitarian crises. However it is important to make some reflections concerning also the second aspect of the digital divide especially concerning the disparity of the knowledge. This is very interesting to be analyzed in particular in developed countries.

As regards the reduction of digital divide even if is difficult to find a solution, many organisations are currently working in the process. To better understand what are the problems and benefits, but also the social implications generated by the use of new technologies is good to analyse a specific event that will allow us to explain in more detail what are the dynamics and the reflections we can do on this theme.

The case study of Nepal: implications and challenges derived from the use of new technologies

In this chapter, it is my intention to examine the case study of Nepal, focusing on the consequences of the massive earthquake that stroke the country on 25 April 2015. The main purpose of the analysis is to monitor the communication process during such event, focusing on the types of technologies needed. Moreover, I will identify the role of the various actors involved in the emergency and examine the tools used to coordinate the efforts. The research questions I will try to answer are: who were the actors involved during the Nepal earthquake? What kind of technologies were used by the different actors to communicate between them and with Nepal population? What was the role of the private sector? What were the social implications derived from the use of such instruments? Finally, this chapter aims to define the new trends in employing ICTs to cope with natural disasters, and to identify the key factors for an effective communication. The last part of the chapter is dedicated to a reflection on the earthquake in Amatrice occurred August 24, 2016, an event that has brought new considerations useful to my research. I do not intend to carry out a systematic comparison between the case of Nepal and the case of Amatrice, but I would like to read Italian events in light of lessons learned with the analysis about Nepal.

1. The Nepal earthquake: consequences of a disaster

On April 25 2015, Nepal was shook by a magnitude-7.8 earthquake. It was one of the most disruptive earthquake occurred in Nepal since 1934. More than 8000 people were killed and the earthquake caused extensive damages in several areas. The epicentre was in Gorkha District, 77 km northwest of Kathmandu, the capital of the country. The earthquake destroyed houses and devastated whole villages, especially near the epicentre, and was a worldwide-known tragedy. As we shall see later it was an event that had a wide resonance throughout the world because of its devastating effects. According to a UN Dispatch, here is a list of the Nepal earthquake effects.

Number of people killed: 8,617
Number of people injured: 16,808
Number of people displaced: 2.8 million
Number of people affected: 5.6 million
Number of people in need of food assistance: More than 1 million
Number of hospitals damaged: 26
Number of houses destroyed: over 473,000 (UN dispatch, 2015).

The reason why I provided such list is that the sheer numbers indicate the utter seriousness of the event. Its media coverage was among the highest of the latest years. That should come as no surprise, for, according to the UNOCHA report "Nepal Flash Appeal Revision", after the earthquake there were 2.8 million people who asked for assistance (UNOCHA, 2015: 5).

It was indeed a catastrophe. After the event, 1.4 million people needed food assistance, because the earthquake had destroyed part of their agricultural sustenance. There was a general water shortage and several infrastructures, including schools, hospitals and roads, were either destroyed or not usable. Moreover, not only did the earthquake cause damages in terms of money and life losses, but it deeply affected the country's social dynamics. For instance, women, as typical in such cases, were much more exposed to risk than men. Several cases of sexual violence were certified. Relief operations were urgent almost everywhere in the country. In order to guarantee the success of the operation, it soon revealed necessary to decide where to provide help first. A ‘severity scale’ was the tool employed to perform such evaluation. The scale, which is commonly used to classify disasters, is primary based on the following criteria: number of buildings destroyed; temporary migration; number of people injured; socioeconomic vulnerability (vulnerable communities and groups of people); physical vulnerability (consequences and changes at a territorial, topographic and physical level). (UNOCHA, 2015: 54)

Soon after the earthquake, many organizations (including the ones I have introduced in the previous chapters) took action to support the population of Nepal. The severity of the situation was confirmed when authorities declared a

state of humanitarian emergency. In order to provide a clear picture of the massive amount of people and organizations that were mobilized and to give a detailed analysis of what has happened in Nepal, I will now consider the various features of the emergency.

2. External communication: the media coverage of the event

The earthquake in Nepal was a media event of great importance for its exceptional, certainly for the number of victims and for the destruction it caused. Newspapers and news programs all over the world have spoken for days about the earthquake, even after the event[61]. But also social media, web sites and platforms discussed about this event. Like other tragic events, also in the Nepal case we can see the contradictions of technology. Indeed, it is true that the use of the media has fostered the spread of the information about the earthquake in every part of the world. But at the same time it was very criticized the way in which this earthquake has been represented by newspapers and media. Indeed, they shifted the focus on aspects which did not give a true representation of the reality (The conversation, 2015).

The brutal images of the death of many people have been manipulated and used by media. They were judged not very sensitive. MIR Suhail, a political cartoonist of Kashmir, launched in the network satirical images with the intention of criticizing the way in which the Indian media had represented the event (The conversation, 2015). This event also shows the contamination and the mutual influence between traditional media and new media. They have influenced each other in the representation of this crisis situation.

Social networks have been a mean of protest against the exploitation of information. They were also the means of recruiting for volunteers and donations to help communities affected by the earthquake. Media in general have done much to create a supportive network and to involve many people in the rescue process that still goes on. Especially the use of social networks has led to the mobilization of a large number of people. To give an example: on Twitter there

[61] To read some articles: http://abcnews.go.com/topics/news/disasters/nepal-earthquake.htm, http://www.bbc.com/news/world-asia-36089960

was a great spread of hashtags such as: #kathmandu, #nepalearthquake, #nepal, #nepalese, #nepali, [62] all words that recall the geographic location where the earthquake occurred. Many organizations have used Twitter to recruit support and promote initiatives. Such as UNICEF that through its Twitter profile invited its followers to make donations. Or WFP than continues to update its followers on reconstruction work.

The mobilization on social networks has involved not only the civil society, but also the organizations that have mobilized for the reconstruction. They have used social networks to create a point of contact with their audiences.

3. Actors involved in the rescue process

As in other emergency cases, different actors got involved after the Nepal earthquake. Though they form a quite complex structure, the actors could be divided into three different groups: UN agencies; governments and institutions; the private sector. To begin, at the head of the rescue process there was the Nepal government, which was in charge of coordinating the operation at a national level. Then, in order to create more effective connections among the actors, the decision was made to assign the various tasks following a hierarchical order. For instance, every district was assigned a group of institutions to coordinate the rescue works, thus containing the problems and providing a better response at a local level. Also in this case we can see how the coordination and consequently the good communication is important. The rescue activities are divided into hierarchical and widespread manner, to be sure that the work is effective, it is essential that there is a sharing of information at all levels and thus a good communication. The most active institutions in the initial rescue process were the Chief District Officers[63] and the District Disaster Relief Committees[64].

[62] https://ritetag.com/best-hashtags-for/nepalearthquake

[63] The chief district officer (CDO) heads the District Administration Office (DAO) as representative of the central government, The CDO is also responsible for coordinating all district level offices (The Asia Foundation, 2012: p.11)

[64] District Disaster Relief Committees (DDRC) "is a permanent outfit at the district level to coordinate relief and preparedness. DDRC is chaired by the Chief District Officer (CDO) who is the main administrative functionary to maintain law and order at the district level"(NSET, 2008: p.9)

UN agencies as well took part in the relief work; every agency was responsible of its particular sector – for instance WFP and FAO in nutrition sector, UNICEF in education sector etc ... - and took care of specific issues. As a matter of fact, the number of agencies which offered their help during and after the earthquake is quite high.[65] It is for this very reason that I have decided to discuss in some detail only the most significant among them, reporting their main tasks as well.

- Coordination: UNOCHA, and UNCHR.
- Early recovery: Save the Children, United Nations Volunteers, Relief International etc.
- Education: UNICEF, Action Aid, Save the Children.
- Emergency shelter: International Federation of Red Cross Red and Crescent Societies as co-lead.
- Food: FAO, WFP and Save the Children.
- Health: United Nations Population Fund, United Nations Children's Fund, Save the Children, Nepal Public Health Foundation.
- Logistics: WFP, International Organization for Migration.
- Nutrition: WFP, Save the Children

Though the list does include only some of the organizations involved in the Nepal emergency, it should nevertheless highlight both the complexity of the intervention structure and the efficacy of a coordinated sector-based relief work. As a matter of fact, it is considering the complexity of the emergency that we may comprehend the utter importance of coordination and communication.
However, though agencies did play a key role in providing help to the Nepali government and population, the private sector was no less significant a force. It contributed greatly to the rescue work, particularly facilitating communication.

[65] To read the complete list:
https://www.humanitarianresponse.info/es/system/files/documents/files/nepal_earthquake_2015_revised_flash_appeal_draft_as_of_11june_10h.pdf

4. Internal communication: how the Emergency Telecommunication Cluster (ETC) worked

In the first chapter, various features of an emergency situation have been examined. We discussed what kind of organizational dynamics is more effective to manage a disaster. We have also identified who are the main actors involved in the humanitarian process and how they work/should work together. We have established that coordination and communication are necessary for the success of an operation. Now, we must apply such factors to the specific case of Nepal. We could investigate what kind of technologies were used to communicate during and after the earthquake. We could also analyze which specific communication strategies were chosen by the organizations involved. We will do so, though only partially. Indeed, for the emergency context of Nepal was very complex, I have decided to focus my analysis on the organizations that proved to be the most relevant in the communication field.

As far as communication is concerned, the most relevant cluster[66] in Nepal is to be found in the Emergency Telecommunication Cluster. Such unit is widely known and is committed to provide support during every humanitarian emergency. According to the ETC Situation Report n. 13, the cluster managed to improve the communication process in Nepal in various ways:

- It provided all relief workers with a safe Internet access and wireless connection;
- it shared information with other clusters through an information-sharing space on their website;
- it collaborated with Ericsson so that the operators' cell phones would have free tools and free access to communicate;
- it based its work on crowd-sourcing information, to share data and text documents that reported fundamental information about the situation.

Another important information and coordination source used by the ETC may be identified analyzing its documents and reports.

- It organised working groups to better understand the situation, perpetually updating and improving the efficacy of the intervention;

[66] To learn more on the approach of the cluster refer to the first chapter

- ETC also made a large use of mapping systems, to highlight the geographical areas most affected by the quake and to re-establish communication in these areas.

As we can see in these emergency situations, technology has become crucial in the communication.

According to the ETC reports, more than 1.500 operators from 250 different organizations enjoyed ETC services. (ETC, 2015: 1)

As we may find in documents such as the report written by Ananda Raj Khanal, Director of Nepal Telecommunications Authority[67], the mobilisation, organisation and coordination of the forces was massive.

In the report, Khanal offers a detailed description of the various steps in which the emergency was structured, from the beginning of the earthquake to the rebuilding phase[68]. In such occasion, ETC collaborated with other organisations, such as the Nepal Emergency Telecommunication Continuity Management System (NETCOMS) and the ITU. The ITU's contribute was capital during the disaster, supplying the operators with 35 satellite telephones, ten satellite Broadband Global Area Network terminals, solar panels and laptops. As we may notice, in Nepal digital and mobile technologies were an essential element, not only for the population, but primarily for all the organizations involved. The contribution given by the private sector was crucial, especially in the communication field.

5. The private sector: actors involved in communication

That is the reason why I would like to focus my attention on the role played by the private sector during the Nepal earthquake. As previously discussed, several companies commonly work in collaboration with international organizations to rebuild and finance disaster-affected countries and provide them with proper tools. It is in this very field that innovative technologies are often experimented.

[67] Nepal Telecommunications Authority is the body that regulates telecommunication field in Nepal it collaborates to create a competitive environment for telecommunication services.

[68] For more information visit http://www.internetsociety.org/sites/default/files/INET-Kathmandu-Ananda%20Raj%20Khanal.pdf

The questions we can ask in this matter are many. What motivates a company to intervene in these situations? What benefits it draws? What are the benefits for the population? Let us clarify.

When the Nepal earthquake occurred, a long list of private donors took action to bring relief to the population. Among them, was Microsoft. After the disaster, the company mobilized part of its staff to help the communities affected by the quakes. They equipped 150 volunteers with Skype-provided cell phones[69], so they could make free international calls. They enabled the local people who did not have cell phones to call their family. In addition, the company installed wi-fi and hot-spots, supplying the people with an Internet access and improving the quality of communication. They also built charging stations. Moreover, new technologies were developed to support other necessary services, such as education and reconstruction too. Indeed, Microsoft's effort was a long- term one, for not only did it provide tools and technologic devices during the emergency, but it helped during the reconstruction phase as well. It was for this very purpose – support the reconstruction after the earthquake - that the **Microsoft Innovation Center Nepal**[70] was founded. The project was created in collaboration with the local government and vendors, offering useful programs and services to both students and customers, thus enhancing the ICT market in Nepal. The importance of the intervention of the private sector in the relief efforts is critical. In the case of Microsoft the investment in technology and philanthropy is not just a matter of business, but an added value for the company and for its reputation. It also implies the possibility of opening up new potential markets and it allows to create more inclusion among people concerning the use of technologies. Microsoft key concept is “Empowerment begins with inclusion”[71]. Their goal is to introduce the technology in an inclusive way. Especially in the case of Nepal, by reading the articles published in the Microsoft site, it emerges the clear objective of introducing instruments for economic rehabilitation of afflicted countries. The intervention of the private sector in general supports the development of the company, but not only.

[69] Phones with Skype, which allow you to make calls and video calls with the use of the internet
[70] http://micnepal.org/
[71] https://www.microsoft.com/en-us/philanthropies/

There are also positive implications for the population. Indeed for the local population it is an opportunity to interface with new chances for growth and economic development. It is an opportunity for social integration[72]. There are many examples that testify this reality. Nevertheless the introduction of these new technologies can highlight the problematic difference between access to resources and knowledge that allow their use. The initiatives introduced by companies such as Microsoft have introduced new tools. However, these tools must be accompanied by adequate training that is often difficult to bestow.

The Microsoft Innovation Center Nepal launched several other projects, beside **Free Skype International Calls,** a free calling service[73]. Among them, there was the **SunPod**[74], a station which used solar energy to recharge phones. It was built in different parts of the earthquake-affected area and it provided Internet access as well.

Figure 8. Image of SunPod

Moreover, Microsoft promoted other initiatives as well during that period. One of them is to be identified in the "**Debris Management Program**"[75], which proved

[72] https://news.microsoft.com/features/un-and-microsoft-aid-disaster-recovery-economic-development-in-nepal/#sm.000019tqgone68ejlrtjyfnef5q42
[73] http://www.theverge.com/2015/4/27/8505065/nepal-earthquake-free-calling-microsoft-google-skype
[74] http://www.advansolar.com/en/blog/2015/09/01/the-microsoft-sunpod-a-solar-charging-station-wi-fi-hotspot-to-support-nepalese-earthquake-victims/
[75] http://www.undp.org/content/dam/nepal/docs/generic/UNDP_NP_debris-management.pdf

to be particularly effective during the disaster response phase. It consisted in a first of a kind application, which was used by the engineers assigned to quake-hit areas to begin the reconstruction works. The application managed to record all the information about the reconstruction operations, from demolition debris to the reconstruction of buildings and structures. Another quite valuable application which was first launched by Microsoft is **Aawaz**[76]. It has been reported that more than 2000 children in Nepal would engage with such program. It would record the activities performed by the children and it was partially available even without an Internet connection. Furthermore, it was able to record text documents and multimedia materials. Another important initiative by Microsoft which clearly demonstrates the importance of information-sharing is to be found in the Inter-Agency Common Feedback Project[77]. It consisted as a common data hub which was primarily used by the relief workers in Nepal to share information.[78]

However, it is to be pointed out that Microsoft was not the only company which cooperated and took action during Nepal's humanitarian crisis. Other companies of the ICTs sector successfully engaged in the relief work process. Among them, there was Apple. Soon after the earthquake had occurred, Apple used its iTunes platform to invite its users to make a donation to the America Red Cross. Google and Facebook as well gave their contribution to help the disaster-affected communities. They provided useful tools such as **Facebook Safety Check** and **Google Person Finder**[79] which we will analyze in the next paragraph.

6. Technologies used to prevent, manage and rebuild

As previously reported, Microsoft's use of technology during the Nepal earthquake was a capital feature of the disaster response phase. The number of technologic devices used to communicate and to rescue communities during and after the disaster is indeed quite high. In order to offer a clearer picture of the

[76] http://www.nagarikaawaz.org.np/

[77] http://reliefweb.int/sites/reliefweb.int/files/resources/Nepal%20Earthquake%20Inter-agency%20Common%20Feedback%20Project%20Proposal%20v3.pdf

[78] To see the complete list of Microsoft initiatives: http://www.micnepal.org/EventsActivities/DisasterResponse.aspx

[79] More information about Facebook Safety Check and Google Person Finder in the second chapter

matter, I will divide technologies in three different groups, on the basis of the specific phase in which they were employed in Nepal:

- technologies used during the disaster;
- technologies used in the rebuilding phase;
- technologies used to prevent future disasters.

It is to be said that such division is not yet definite. Indeed, a number of technologies have been used in more than a single moment/stage.

On the first place, let us examine the technologies used in the first days after the disaster. Some quite effective examples may be identified in **Facebook Safety Check** and in **Google Person Finder**. The latter is activated during emergencies, such as the Nepal earthquake, and it is a platform which provides a registry for both individuals and organizations to search and post information about each other's status. Unlike Facebook Safety Check, the tool only enables to give information about either missing people or people seeking for their family and affections. It is an information-sharing platform. Information is available to all users, so they can find their family members or provide information about persons found. The Time has reported that in the first twelve hours after the earthquake, about 1,700 records were uploaded (Sam Frizell, 2015).

Figure 9. *Screenshot of Google Person Finder*

Such tools were made available to enable the earthquake-stricken population to let know that they were safe and to get in touch with their family and friends. The difference between Facebook Safety Check and Google Person Finder is that

while on Facebook you must be registered to use the service on Google is not necessary to have an account. This is an advantage for Google even if Facebook is widespread and has been widely used during the earthquake in Nepal.
The efficacy of Facebook Safety Check was acknowledged by Zuckerberg in person, when he claimed that

> "We activated Safety Check and more than 7 million people in the area have been marked as safe. More than 150 million friends were notified and those updates let people rest easier and relief efforts remain focused." Mark Zuckerberg, Timeline photos – Facebook

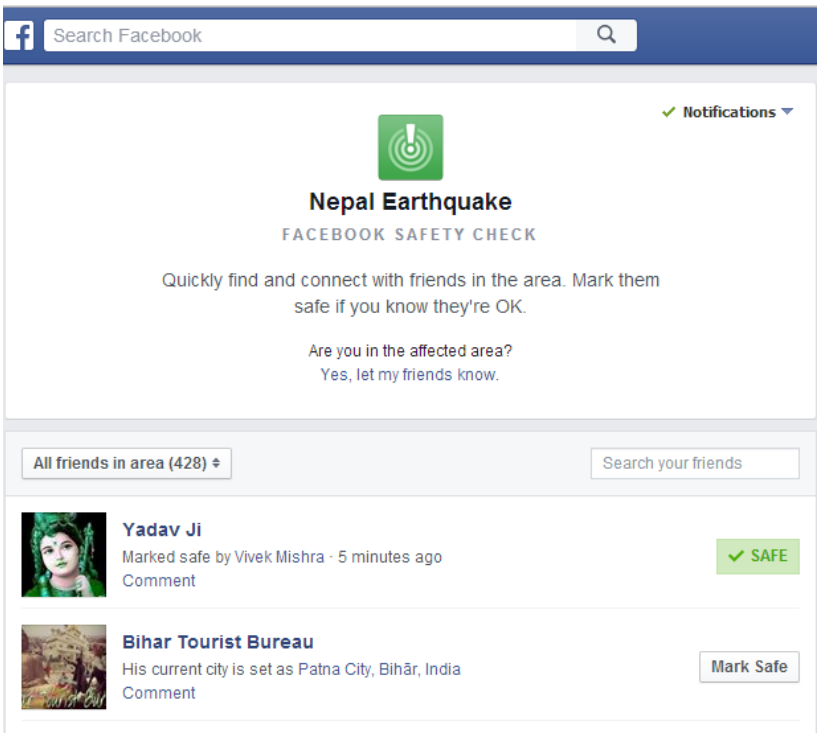


Figure 10. Screenshot of Facebook Safety Check

However it is difficult to make a precise comparison about the dissemination and the use of the two platforms because they provide partially different services.
Also the Twitter community took part in the process too, posting several hashtags to virtually connect people and familiarise users from all over the world with the Nepal earthquake. As a result, all the users who read the hashtag could easily find information through some key words such as #NepalQuakeRelief , #InCrisisRelief, #Nepalearthquake. Though Twitter did not provide an actual tool as Facebook and Google did, it did offer a valuable contribution to the cause.

Indeed, through its platform, it successfully spread information about the disaster, encouraging no profit funds and material donations and supporting local agencies in the coordination of efforts (Nur Bremmen, 2015).

Technologies may be also effectively used in the rebuilding phase of a disaster. Indeed, as far as Nepal is concerned, it has to be pointed out that, despite the social networks were used in the earliest stages of the emergency, they remained essential after the disaster as well. They enabled to coordinate the efforts and create links between organisations and the local people. In the rebuilding phase, the distribution of public information became efficient thanks to the collaboration between the media and ICTs companies such as Viber, one of the most powerful telecommunication companies in the world. A week after the earthquake, **Viber** launched a **messaging system** that every day provided information, news and useful advices to face the emergency and prevent new dangers. BBC World Service and BBC Nepali Service contributed to deepen the topic, offering detailed descriptions of the situation. Media broadcasted both in Nepali and in English, but they transmitted trough Viber platform text messages only, though they were sometimes linked to other information or included pictures. The content of information changed week after week, depending on the evolution of situation.

Figure 11. Screenshot of BBC World Service on Viber

This argument highlights another important issue: the mix of traditional media and new media as we have already mentioned in the section dedicated to external communication. The combination of different media is very interesting, it generates an integration and an addition of information as it happens for the PC that includes in itself radio, TV and newspapers. But in some cases it can not replace other instruments. Indeed, like any technology it has its own limits. In the case of Viber for example the newspapers send news to mobile. This way they can stimulate the reading of the article by sending a notice to all those who have a Viber account. This allows users to take action by writing comments and creating a network, but at the same time it excludes all those who do not have a Viber account. That's why traditional media and new media continue to co-exist in order to complement each other. The traditional media continue to have an important role.

As it has been examined in the first chapter, using technologic devices such as smartphones and tablet, in case of natural hazards, can save lives. However, the radio too can play a key role here. During the Nepal earthquake, the actual

potential of radio broadcasting was expressed in the communication field. Indeed, it provided real-time information in places where Internet access was not possible.

Let us consider an example. A few days after the earthquake, the University of Tribhuvan built a radio repeater to guarantee communication even when other tools and devices where not operative. Radios were connected to the repeater, which would receive the signal on a frequency and then transmit it to another frequency. With such procedure, the message would travel from a frequency to another and could be broadcasted from a place to other, no matter the distance. Moreover, such useful a tool may be used to transmit information in case of other earthquakes as well. Hence, we could consider the radio as a communication device which may help manage both current and future disasters. In the specific case of Nepal, where technology is not widespread yet, radio broadcasting did make a difference.

The project was carried on in collaboration with Disaster Management Initiative (DMI), at the Silicon Valley Campus (Carnegie Mellon University). Such cooperation was particularly relevant, for it clearly displayed the main role of research in developing new, low cost technologies for poor communities as well. To be more specific, the University managed to conceive new strategies and develop communication tools for civil society members, media and humanitarian organizations. Indeed, though the population was undoubtedly helped thanks to communication technology, it was an essential tool for operators too, allowing them to promptly exchange information with each other. It has to be reported, however, that soon after the Nepal earthquake, the analysis of the use of technology revealed some gaps. Moreover, it sparked great debates about the social implications of using ICTs to manage natural disasters.

7. Social implications of using technologies: issues and debates after the Nepal earthquake

It is my opinion that, when dealing with using technologies, a deep reflection is needed. As previously stated in the essay, technology potentially enables everyone to communicate in promptly way. During or soon after a disaster, for

instance, it may be used by the local people, to get in touch with their family and relatives and to get news and information; and by intervening operators, to communicate between each other and with the stricken population. It is for such reasons that learning how to use technology is fundamental. Operators are the trained on the matter, periodically following workshops, conferences, and refresher courses[80]. Local populations, instead, do not have an equally high level of technological competence. This is especially true for such areas as Nepal, in which literacy rates are yet to be improved. Indeed, considering the Nepal case study we have the opportunity to make some reflections upon the matter. Before we start, however, it is important useful to provide a general overview on the media environment of communication and information used in Nepal.

According to the UNESCO, the most widespread media in Nepal are to be found in newspapers, radio, magazines, television and, in the later years, Internet (UNESCO, 2012: p.32). Such means of information are principally owned by the government, the private sector and local communities. Though they are widespread and largely used, Nepalese **media** do have a problem to solve: they **are not provided with any legal, administrative or financial mechanisms to support media diversity** (UNESCO, 2012: p.34). In other words, Nepal cannot count on a transparent regulatory system for broadcasting. As a consequence, information is never entirely neutral nor completely controlled. Moreover, although traditional media are still highly considered and trusted by the population of Nepal, (UNESCO, 2012; p.58) and even if the Internet rate is steadily expanding, the **ICTs market is underdeveloped**.

In 2011, the ITU ranked Nepal 131st in the global ICT Price Basket (UNESCO, 2012; p.88). One of the major problems plaguing the country is the 'digital divide'. As a matter of fact, according to the World Information Society Report "Bringing the Digital Divide", every country in the world is affected by such problem, for there are different types of digital divide as we saw earlier. (WSIS, 2007: p.2)

[80] To see some of these project you can visit the link: http://www.icdo.org/en/news/scientific-workshop-modern-technologies-disaster-and-crisis-management/ or http://www.cobacore.eu/technology-for-resilience-the-humanitarian-application-of-emerging-technologies-in-disaster-management/

However, as far as Nepal is concerned, the situation is particularly delicate. According to a Management Information System (MIS) report, published by the Nepal Telecommunication Authority (NTA) in 2015, only 46,04% of Nepalis has an Internet connection, that is, less than half of the country's population (MIS, 2015: p.2).

In addition, a large portion of the population does not possess the necessary knowledge to use technological devices. The experts have referred to such phenomenon as a **general lack of digital literacy skills**. Despite several initiatives have been promoted to encourage technological education, digital literacy rates remain low among Nepali people. The most damaged categories have been reported to be women, children and aged people. A distinction must be also made between the ICTs' use in rural and urban areas of Nepal. Not surprisingly, rural people are reported to be less skilled, for it is often a great challenge to provide service and Internet access in low-populated centers.

According to Internet World Stats, nowadays about 6,400,000 Nepali people have access to the Internet. Let us compare such number with the 32,111,345 habitants that made up the total population of Nepal (Internet World Stats, 2016). Only one person out of five can connect to the Internet. Quite interestingly, most of them are men. Such phenomenon is not only related to digital divide, but also to the lack of those infrastructures that allow effective Internet access.

Several projects and initiatives have been designed and implemented to solve such problems, in the later years. Among them, there is the Nepal Wireless Networking Project[81], a non-profit initiative created to distribute wireless connection in the rural areas of Nepal. After the earthquake, the project moved its focus to the quake-stricken areas, but remained faithful to its original purpose. As previously reported, digital divide and lack of infrastructures are the main obstacles to the application of technology during natural disasters. However, other issues concerning the use of new technologies have sparked more than a debate in recent years.

Another quite controversial social effect of the use of technology has been often identified in Facebook Safety Check. Such tool enables users to inform their

[81] For more information: http://www.nepalwireless.net/

family and affections about their current condition, so it is widely perceived as useful, or even necessary. However, Facebook does not automatically activate it every time a natural hazard or an attack occur (ICTworks, 2015). Then, what are the criteria that determine the choice to activate such tool or not? Is it ethically correct to activate it only in some occasions? In order to properly answer such questions, it is to be first specified that Safety Check has become popular only in the latest years, after it was extended to terrorist attacks as well. Such decision, however, has lead to more than a controversy. The debate became particularly enflamed when Facebook decided to activate Safety Check for the terrorist attacks in Paris, while ignoring other events such as the Beirut bombings of 12 November 2015.

To react to the general wave of criticism, Alex Schultz, Vice President of Growth at Facebook, replied that

> "We chose to activate Safety Check in Paris because we observed a lot of activity on Facebook as the events were unfolding. In the middle of a complex, uncertain situation affecting many people, Facebook became a place where people were sharing information and looking to understand the condition of their loved ones." Facebook Timeline- 14 November 2015

In such case, users' social activity was the determining factor in the activation of the tool. Yet, this is not to be applied to every single country or event.

During the earthquake in Nepal, it was evident that people would have benefitted from Safety Check; and they did. Nevertheless, it has been argued that people affected by other catastrophic events would have benefitted from such tool as well. What are, then, the main factors that lead Facebook to activate such service? Heavy activity on the social network? The seriousness of the event? The total extent of damage?

The debate is still open and includes different points of view. If, for instance, during the Nepal earthquake Safety Check was undoubtedly useful, it was due to electricity and good reception. If, on the contrary, a disaster-affected area cannot provide an Internet access, the tool remains unusable.

Another implication of using new technologies is the possibility of **spreading false news** that may create further confusion, as it happened in Nepal (WACC, 2015). Nowadays, traditional media commonly address their audience through technology, broadcasting on Facebook, Twitter and other social networks. However, during the Nepal earthquake they transmitted some incorrect information. This happened in the first hours from the disaster, when infrastructures were not functioning yet.

In order to examine such specific circumstance, it may be useful to look at the sources. An article entitled “Nepal needs Better Communication Infrastructure to Respond to Disaster”, which was published in the World Association for Christian Communication website on 11 May 2015, reports the comment made by an expert in communication, Dr. Orlando Mercado. He stated that:

> “There was false news about “scientists forecasting 9 or 11 Richter scale quake” and “rotten human corpses under the debris”, of food and water shortages in the Kathmandu valley, and of cholera that terrified already scared people of spreading infectious disease and more serious disaster. Similar sensational news helped worsen the situation and forced over 1 million terrified people out of Kathmandu in very few days.” (WACC, 2015)

The clarity and precision of information is crucial in such moments. During the earthquake, the spreading of misinformation generated high concern among the population. Through the social networks, false news spread even more, quickly aggravating the damage. Users mobilized on Twitter through the hashtag #GoHomeIndianMedia, to protest against the insensitivity of Indian media. (First Post, 2015). Such fact aggravated an already existing discontent in the country, causing increasing tension and distress. Yet, the negative aspects and threats that lie behind the use of new information technologies do not end here.

Indeed, another downside boosted by the spread of information technologies is **cybercrime**. People generally tend to become more susceptible in case of crisis, so malefactors often try making money and taking advantage of the situation. It happened in Nepal as well. To support their initiatives and work, organizations

relied on financial assistance of those benefactors that decided to make a donation. However, as the crisis continued, impostors gradually took advantage of honest benefactors hiding on the Internet and using false identities to get donations. Being aware of such risk, the FBI warned all those who wanted to donate (FBI, 2015). In order to stop such phenomenon, a few days after the earthquake Barracuda Labs, a global team specialised in studying technological ecosystem and its potential threats, collected evidence of several scam attempts linked to the Nepal earthquake. Scammers would send e-mails to steal donors' personal information, under the guise of raising funds for the affected population (Security Affairs, 2015). Such despicable actions should make us understand how it has become easier to deceive people through new technologies.

Having dealt with some of the negative aspects of new ICTs, it is now to be specified that technology is not neutral; its functionality depends on many factors. These mainly are: environment, education, infrastructure and culture.

Though technology does provide risks and possible issues, it is my opinion that there is a way to overcome difficulties. Indeed, it is basing on such difficulties that we may be able to identify some guidelines to improve our use of ICTs and define their role during disasters.

8. New trends and improvements related to the use of ICTs during disasters. Lessons learnt from the Nepal earthquake case study.

While doing some research wok on the Nepal earthquake, I realized that ICTs may cause more than a difficulty. However, I also observed that such issues may be solved. The Nepal earthquake revealed obvious deficiencies on the use of new technologies. Such were mainly caused by the delicate and complex situation, context and socio-cultural framework of the country. At the same time, however, numerous initiatives and technological solutions were conceived by the organisations involved, to promptly respond to the breakdown of essential public services, such as information, education and infrastructure. Thus, basing on the Nepal case study, I have tried to identify the most effective uses of technology and its key role in managing disasters. It is for such reasons that I have formulated a list of initiatives and solutions that have been taken by Nepal government,

NGOs and other forces in the recent years. All the initiatives specifically address problems related to the use of ICTs during the Nepal earthquake. However, they may be also interpreted as general guidelines created with the purpose of promoting implementation of information technology.

- *Solving the problem of digital divide, improving Internet access and digital literacy, and spreading awareness on the threats that lie behind the use of the Internet*

Last year saw the creation of a new initiative, called Code for Nepal[82]. It primarily focuses on the importance of **digital literacy**, especially for women. Indeed, if women were instructed on technology, they would be able to improve both their general knowledge and their position in society. Moreover, this would help them in crisis situations as well, for they are one of the weakest and most endangered social categories. Sexual abuse rates, for instance, still remain dramatically high after a disaster, such as an earthquake. It is for such reason also that **creating more awareness** on the use of Internet and ICTs would mean to protect them. The project is based on the use of open data, to provide access to a wide variety of documents and information. (Code for Nepal, n.d.).

- *Improving infrastructures, such as wireless connection, to partially solve the Internet access problem*

As previously reported, in recent years there has been a significant increase in **wireless infrastructures** in Nepal, thanks to a non-profit project that was started before the earthquake. Since then, the project has grown and remarkably developed. Nepal Wireless[83] works to provide Internet services especially in rural areas. The founders believe that creating a wireless connection means to significantly **improve rural communities' life** and in every aspect. It aims to spread a kind of technology that positively affects daily life in its every dimension. Among the most interesting points of the project, worth a mention are E-Education, E-Health, Digital literacy, Communication, Local e-commerce, Job

[82] For more information about Code for Nepal project: http://codefornepal.org/en/
[83] http://www.nepalwireless.net/

creation, Research and Development and Climate Change Monitoring (Nepal Wireless, n.d.).

- *Potentiating crowd-sourcing platforms and implementing big data collection*

To overcome both the lack of information and communication difficulties that characterised the earthquake's aftermath, it was decided **to make use of open data tools**, such as OpenStreetMap[84]. This application was created with the purpose of providing detailed maps of the disaster-stricken areas, with the support and collaboration of various organizations and operators. In such occasion other open data instruments were used. Among the most interesting, we may find Quakemap.org, which aimed to help people to communicate their specific needs to relief workers, and Open data Kit, a data collection platform useful to share documents and information with the organizations involved. The latter was particularly efficient in bringing relief to the local people. (OpenSource.com, 2016).

- *Improving the use of visual materials*

As far as ITCs are concerned, it may be easily noticed that one of the latest years' most common tendencies is exchanging **visual materials**, such as photos and videos. Indeed, with the introduction of technologic devices such as smartphones and tablets, many people have been able to capture, both literally and symbolically, the tragedy of the earthquake. Visual materials were soon shared on the social networks, quickly spreading around the world. Such phenomenon certainly caused a global emotional reaction, also increasing public awareness on the disaster. It is for such reasons that, as already mentioned in the first chapter of the essay, agencies such as FAO, UNICEF, WFP currently make use of images and visual materials to amplify emotional impact and to sensitize people on their campaigns. The power of images may be noticed examining some initiatives that were organized after the earthquake. Among them, there was a

[84] https://hotosm.org/projects/nepal_2015_earthquake_response

project organized by Photo.Circle team[85], who promoted a worldwide fundraising to help one of centers hit by the earthquake, the city of Patan. In order to sensitize the public, the team decided to include photos taken from different collections, such as the Nepal Picture Library, the Peace Corps Nepal Photo History Project and even photo.circle users' albums. The renown quality of the initiative is indeed to be found in its use of the power of images to shake consciences and raise money, combining different means of communication and innovative technology:

> "By the end of October 2015, just days before the opening of Photo Kathmandu 2015, we had already raised 12,000 USD. Over 70 people from all over the world had contributed to the fundraiser by buying one or more limited edition prints. During the official opening ceremony at the Patan Museum, the Photo Kathmandu team proudly handed over a cheque of that exact amount to the president of the Kwelachhi Tol Sudhar Samiti, which would be leading the rebuilding effort." (*Thomas Pouppez*- Photo Katmandu, n.d.)

- *Intensifying collaboration among private sector, researchers, organizations and donors.*

As far as collaboration and coordination among organizations and institutions are concerned, there has been a significant improvement after the Nepal earthquake. As previously stated, **cooperation, especially between the private sector and IGOs** is quite common during crises. Such is a remarkable feature of emergency management, for cooperation among different actors can truly contribute to improve knowledge on new ways of communication. Moreover, collaboration is a key factor in every phase of the recovery process. For instance, in many rebuilding cases, if the different actors involved were able to join their forces they were likely to succeed in finding solutions, for everyone **shared different competences and skills**. This is particularly true during assessment phases as well, for, as it has been reported

[85] Photo. Circle is a platform that allows to create themed photo albums

Overall, this assessment provided crucial information for the planning and implementation of early-recovery efforts by a large variety of partners. Crucial to the success of this assessment has also been the active involvement of a variety of partners in the assessment design, implementation and analysis, including UN Agencies, the Nepali Government and IGOs (Reach, n.d.).

- *Increasing the use of low cost technologies*

If we consider all those technologies used to face the disaster in Nepal, we may soon notice that they have something in common: they are all low-cost. Indeed, Facebook, Google, Twitter and the Internet in general are all **low-cost tools**. Mobile applications too share such feature, for you only need an Internet connection in order to use them. Furthermore, other platforms, such as YouTube, commonly enable people to **share and get information without any costs**. Such an important trend has been quickly developing in recent years, thus globally granting multiple free-information channels. Low-cost technologies are most advantageous tools and they should be highly considered, especially during humanitarian crises. Why? For they provide an easier and quicker way to spread information all around the globe. This does not mean that everyone can have access to them because as mentioned above some people and communities do not have means and resources to access it, but it can be an advantage more to face disasters.

- *Creating better synergy between traditional media and new media.*

Another important trend which first emerged in the aftermath of Nepal earthquake is the creation of a **synergy between traditional media and new technologies**. Such an ambitious project mainly aims to enable anyone to exchange information. An example of such synergy may be found in the collaboration between Viber and BBC[86], which together in Nepal launched a "lifeline", to provide the population with useful advices and news (Journalism.co.uk, 2015). Moreover, as previously reported, social networks played a key role during the earthquake. We could even say that their content offers the most direct evidence

[86] http://www.bbc.co.uk/mediacentre/latestnews/2015/bbc-nepali-viber-launch

of what the earthquake caused. Hence, they had a stronger impact than traditional media, which, on the contrary, mishandled the dissemination of news. If we search for a confirmation, it may be sufficient to consider the inconsistent way the Indian media disclosed and represented the event. Indeed, after this scandal, it was necessary to enhance and improve relations and cooperation between traditional media and social networks. Such improvement would enhance information accessibility (more channels transmitting the same news to enable more people to see it) and guarantee more reliable information.

Though I have made reference to the Nepal case study, similar initiatives and programs could be applied all over the world. As a matter of fact, recent years saw the organization of many projects, workshops and conferences to better face natural disasters. New technologies have been invented in every part of the world and the awareness on such matter keeps increasing. It has been widely thought that, for technology pervades every sphere of our lives, it may be also useful to prevent and manage situations that we cannot control. The important thing is to possess such tools and to make responsible use of them. The case of Nepal has been one of the most sensational on a worldwide level in recent years.
However, in recent months I have done some analysis useful to my research taking inspiration from an Italian case occurred a few months ago. This event allowed me to add a new piece to my search making reflect on the importance of sharing the information of which we'll talk below.

9. How the spread of new technology allows users to become part of the crisis management: the case of Amatrice

In these days, I have followed the outcomes of a most tragic event that struck central Italy. A 6.2 magnitude-earthquake hit the Lazio region on 24 August 2016, causing the death of 297 people. Compared to the earthquake in Nepal, we can certainly say that this was a less devastating phenomenon, both in terms of casualties and damages. For it was not considered as a humanitarian emergency, there were not the same dynamics of Nepal and different operators intervened. However, I would still like to dedicate a section of this essay to the

Italian case, for it allowed me to develop further considerations on the role of social media and open data platforms in emergency situations.

Indeed, it was during such tragic event that I fully realized the importance of technology. Although technology's contribution was essential in Nepal and during other recent earthquakes, in this case there was a significant improvement both in terms of cooperation between government and local communities and in the management of the sharing-information process. Such elements are particularly useful to conclude my thesis on the importance of information sharing and on the peculiar role of technologies.

But what was the role of technology in this situation? Traditional media and social networks, in Italy and not only, have treated this event very thoroughly. Newspapers such as The New York Times and BBC[87] have dealt with the case. The case had an important media coverage.

Twitter for example has launched many hashtags as #Amatrice #earthquake #Italy, to involve a wider part of the world and to sensitize audiences. People have mobilized all over the world with their media solidarity[88]. Even Facebook has been very significant activity of users in the hours following the earthquake. Facebook has also enabled in this case the Facebook Safety Check[89]. Social networks have been important tools for the dissemination of news and they give a positive contribution to spreading awareness among citizens. We could see how the use of social networks and technologies can be used to spread news and to produce knowledge among citizens in a useful and productive way even for those who work in the relief effort. It is at this point that comes my reflection. The use of media and technologies may be useful in the moment in which it develops a conscious knowledge of their use by users.

- *Raising a deeper awareness among the citizens through the use of new technologies.*

[87] http://www.nytimes.com/2016/08/25/opinion/italys-fragile-beauty.html?_r=0, or http://www.bbc.com/news/world-europe-37172460

[88] https://www.bustle.com/articles/180355-pray-for-italy-memes-tweets-show-support-for-the-italy-earthquake-victims

[89] http://uk.businessinsider.com/facebook-activates-safety-check-central-italy-earthquake-amatrice-2016-8

I would like to mainly focus on the **users**, in order to affirm the authentic value of ICTs and the potentials of their spread. This is a new trend for me very important in the use of new technologies for disaster management. As we said before social networks, sometimes, do report either false or incorrect news. After the earthquake in central Italy, the old debate on the effectiveness and the actual reliability of social networks has aroused once again. As a matter of fact, to solve such issues, new information filtering systems have been conceived. One of them is the "**Progetto Torcia**"[90], a collaborative management platform made for emergencies. The project was funded from the Lombardia region in collaboration with the "Politecnico di Milano". This demonstrates the importance of collaboration between government and universities. The innovative potential of this platform consists in using information from social networks and web 2.0 to facilitate the collection of data. Torcia integrates social network information with other institutional information, and it compares and combines them in order to offer more reliable and detailed news. It produces more accurate information also thanks to the **citizens' contribution**. The system works in two ways to create reliable data and follows two mechanisms. The first one is based on the statistic of the event, that is, on the semantic properties of the words and their meaning. The second one gains experience from previous events by adjusting the parameters of the system to understand the degree of reliability of the information. (Calzolari, 2014). This project summarizes in itself the future of technologies in maximizing the management of crises. It includes **information sharing, collaboration and communication through the use of technology**. Of course, to achieve the desired results and also to extend such tools to the rest of the world, it is necessary for all countries to continue to reduce the digital divide and the problems deriving from the introduction of technologies. Another key factor is **increasing public awareness** on the matter.

In conclusion, the inner value of ICTs is indeed very relevant. According to Dr. Sterlacchini, who works in the research group of *Geosciences and Information Technologies (GIT)* ICTs can be useful to:

[90] http://www.fondazionepolitecnico.it/cosa-facciamo/progetti-di-innovazione/item/torcia-piattaforma-di-gestione-collaborativa-delle-emergenze#.WBG8-PqLTIU

1) support the decision-making process of the authorities responsible for forecasting, prevention, monitoring and management of critical issues of different nature in terms of their areas of jurisdiction;
2) increase the level of knowledge and awareness of the communities who live in high risk areas, through their active involvement;
3) increase, with concrete and participatory actions, the security level of the territory;
4) increase, ultimately, resilience to both individually and of the entire community. (Dr. Sterlacchini - Il Giornale della Protezione Civile, 2016).

Finally, it would also be useful in the education field. Indeed, especially in endangered areas, it would be a good idea to promote specific courses dealing with the role and the many possible uses of technology. The first step to implement the effective management of the crisis is to create awareness and understanding among communities in order to learn how to handle emergency situations and the tools available to address them. It would also, perhaps, encourage people to deepen this interesting and fascinating topic, which is, in my opinion, still poorly treated.

Conclusion

As we saw, communication plays a crucial role at every stage of the natural disaster management. The actors involved in this field are many: intergovernmental organizations, governments and institutions, NGOs and private sector. For this reason information gathering and spreading have become increasingly important to manage difficult situations and to coordinate rescue and rebuilt activities. Indeed, they play a key role in both external and internal communication process. This is important not only for organizations that deal with crisis management, but also for civil society and afflicted communities.

Moreover, as highlighted in the research, we should also conclude that technology too has become more pervasive and increasingly useful in the management of natural disaster, for that reason it facilitates communication procedures. In this essay, we analysed different aspects of the communication through the use of technology and the communication among the operators involved in crisis management. We also evaluated different stages of their work and the role played by communication in each of them.

A special focus was made on the technologies used by afflicted communities and civil society in these situations. During the search positive and negative implications have emerged. For instance, the digital divide phenomenon has been analysed as well as treats arising from the use of technologies and initiatives to address these problems. This investigation allowed us to understand what are the new trends in the use of technical knowledge: digital divide reduction, internet access implementation, crowdsourcing platform empowerment, low cost technologies promotion, traditional and new media synergy, collaboration among universities, organizations and private sector. As far as the social impact of technology is concerned, I have pointed out the role of users in the management of disasters, after the introduction of new technologies. Indeed, the civil society has become an active part of the reconstruction process in humanitarian crisis. Thanks to the introduction of new devices and tools users come into play as new actors in crisis management. Such fact suggests another reflection: much has been done to reduce the digital divide and persisting

differences in access to technology, but this is not sufficient. Indeed, the introduction of computers in this field defines extra thoughts and more detailed considerations on this argument. One of these is the issue: “the user awareness”. It is not enough to reduce inequalities in access to technologies. The user must be aware that its contribution in the adoption of technologies can be of vital importance in times of crisis for instance sharing posts, creating local support groups on Facebook, using appropriate applications. All these can be efficient ways to concretely address the emergencies.

Such tools must be used with a certain degree of competence, of course. In my opinion, this kind of awareness is not yet widespread. This is one of the many aspects that could be deepened. Other topics, related to this research, may be investigated. For example it is important to mention the philanthropic support of private companies that invest financial resources to help afflicted communities. It would be interesting to deepen the relationship between afflicted communities and private sector, focusing on advantages and disadvantages. Another point to discuss could be identified in the collaboration of traditional and social media and in the news-spreading process. In particular the effect that the simultaneous presence of these different media (new and traditional) brings on information. It is important to underline that for some of these topics the existing literature is still very limited, despite the gradual expansion of this field of research and reflection. The analysis has shown what makes efficient and effective the use of these new technologies. So not only their dissemination, but an aware use of that and the ability to create social links with such tools. The first step, for sure, to develop awareness is talking about this subject and do research on the issue. Universities, institutions, private sector and organizations involved in this field can contribute to the research. As we saw they have economic resources, different knowledges and different experiences on this field that can be helpful to further develop this area of research.

In my opinion the main difficulty of this work has been providing a general overview of the subject, because of the scarcity of documents and the difficulty in finding them. Indeed, though I have found many newspaper articles, reports and

institutional documents that deal with such topic, a proper bibliography is not yet available.

This could be a very interesting subject of study to spread better awareness on the potential of technology in communication during emergencies. It would be interesting, when the topic will be more thorough, to teach young people and adults to use these tools and the advantages they offer in these situations. It will be crucial to teach how to use applications in emergency situations, especially social networks considering their diffusion, in times of natural hazards. The topic is very interesting and full of ethical and social implications.

Acronyms

AIDF	Aid and International Development Forum (AIDF)
CCM	Camp Coordination/Management Cluster
CO	Country Office
CRED	Centre for Research on the Epidemiology of Disasters
CRP	Contingency Response Planning
CRS	Corporate Social Responsibility
DIRT	Disaster Incident Response Team
DMI	Disaster Management Initiative
ECOSOC	Economic and Social Council
ERC	Emergency Relief Coordinator
ERP	Emergency Response Preparedness
ETC	Emergency Telecommunications Cluster (ETC
FAO	Food and agricultural organisation
FEMA	Federal Emergency Management Agency
FSC	Food Security Cluster
GA	General Assembly
GOe	Global Observatory for eHealth
GPRS	General Packet Radio Service
GPS	Global Positioning System
GS	General-Secretary
GSM	Global System for Mobile Communications
HC	Humanitarian Coordinator
HIC	Humanitarian Information Centre
HPC	Humanitarian Programme Cycle
HTC	Humanitarian Country Team
IARMM	Inter-Agency Rapid Response Mechanism
IAS	Information Analysis Section
IASC	Inter-Agency Standing Committee
IBM	International Business Machines
ICT	Information and communication technology
IDI	ICT Development Index
IGO	intergovernmental organisations
IOM	International Organization for Migration

ISCRAM	Information Systems for Crisis Response and Management
ITU	International Telecommunication Union
MIRA	Multi-Cluster Initial Rapid Assessment
MIS	According to a Management Information System
MPA	Minimum Preparedness Action
NERV	Network Emergency Response Vehicle
NETCOMS	Nepal Emergency Telecommunication Continuity Management System
NGO	Non-governmental organisations
NTA	Nepal Telecommunication Authority
OCHA	Office for the Coordination of Humanitarian Affairs
PDAs	Personal Digital Assistants
PWC	Price Waterhouse Coopers
RC	Regional Coordinator
RO	Regional Office
SMS	Short Messaging Service
SOP	Standard Operating Procedures
TA	Transformative Agenda
TacOps	Cisco Tactical Operations team
UN	United Nations
UNDG	UN Development Group
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations International Children's Emergency Fund
VoIP	Voice Over Internet Protocol
WACC	World Association for Christian Communication
WFP	World food program
WHO	World Health Organisation
WSIS	World Summit on the Information Society

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