From Resilient Recovery to Sustainable Development:

L’Aquila Earthquake of 2009

International Recovery Forum
Kobe – Japan, January 16th 2010
April 6th 2009, 3.32 a.m.: a strong earthquake strikes L’Aquila
The earthquake in Abruzzo: the very first hours

**6th April 2009 h. 3.32 am**

- At 3.32 a.m. L’Aquila earthquake
- At 4.15 a.m. Crisis Unit – Civil Protection Department
- At 4.30 a.m. Departure of DPC first team for macroseismic evaluation
- At 4.40 a.m. Meeting of the Civil Protection Operational Committee
- At 4.40 a.m. Departure of the first two DPC operational teams
- At 9.00 a.m. Start-up of the Direction for Command and Control - Di.Coma.C.
  - in the premises of the School of the Italian “Guardia di Finanza”

**First legal initiatives**

**DPCM of April 6th, 2009**

“Declaration of a state of emergency due to the extraordinary seismic events which affected the L’Aquila province and other municipalities in the Abruzzo region on April 6th, 2009” (*ex L. 225/92)*.

**OPCM 3753 of April 6th, 2009**

“First initiatives following the seismic events which affected the L’Aquila province and other municipalities in the Abruzzo region on April 6th, 2009”

**D.L. n. 39 of April 28th, 2009 (converted to Law n. 77 of June 24th 2009)**

“Urgent interventions in favour of the population affected by the seismic events occurred in the Abruzzo region during April 2009 and further urgent measures in the field of civil protection”
The reaction of the Italian Civil Protection System: the forces deployed

Confronted by this big emergency, every single component of the Italian Civil Protection system reacted immediately, giving its own precious contribution to the recovery activities.

<table>
<thead>
<tr>
<th></th>
<th>First 48 h</th>
<th>Maximum value</th>
<th>Today (15/01/2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Brigades</td>
<td>2.400</td>
<td>2.471</td>
<td>422</td>
</tr>
<tr>
<td>Army</td>
<td>1.825</td>
<td>1.825</td>
<td>345</td>
</tr>
<tr>
<td>Police forces</td>
<td>1.586</td>
<td>3.487</td>
<td>683</td>
</tr>
<tr>
<td>International Red Cross</td>
<td>816</td>
<td>835</td>
<td>66</td>
</tr>
<tr>
<td>Volunteers</td>
<td>4.300</td>
<td>9.000</td>
<td>23</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>10.927</strong></td>
<td><strong>17.618</strong></td>
<td><strong>1.539</strong></td>
</tr>
</tbody>
</table>
The work carried out by the Fire Fighters

- Search and rescue operations
- Securing damaged buildings
- Assistance to the population and goods recovery
The earthquake in Abruzzo: the numbers of the emergency

<table>
<thead>
<tr>
<th></th>
<th>The first 48 hours</th>
<th>Maximum level reached</th>
<th>January 15th 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assisted Population</td>
<td>27.772</td>
<td>67.459</td>
<td>10.513</td>
</tr>
<tr>
<td>Displaced People Camps</td>
<td>30</td>
<td>170</td>
<td>-</td>
</tr>
<tr>
<td>Tents</td>
<td>2.962</td>
<td>5.957</td>
<td>-</td>
</tr>
<tr>
<td>Field Kitchens</td>
<td>10</td>
<td>107</td>
<td>-</td>
</tr>
<tr>
<td>AMP – Health Care</td>
<td>13</td>
<td>47</td>
<td>-</td>
</tr>
</tbody>
</table>
The protection of the cultural heritage

Starting from April 6th, there have been 1,715 inspections on cultural heritage goods. 917 where carried out on churches.

45 buildings belonging to L’Aquila’s cultural heritage have been inserted into the Project “Saving art in Abruzzo”
The intervention on the church “Santa Maria del Suffragio”
Collemaggio’s Basilica: what it used to look like...
The Basilica after the earthquake
Collemaggio’s Basilica reopened for Christmas
The previous earthquake emergencies...

The examples below demonstrate damage from earthquakes of at least 9+ degrees on the Mercalli Intensity Scale

**Belice—15/01/1968**
- Magnitude: 6.1
- 296 victims
- Municipalities damaged: 15
- Largest town: Salemi → 11.145 inhabitants

**Friuli—06/05/1976**
- Magnitude: 6.4
- 965 victims
- Municipalities damaged: 119
- Largest town: Gemona → 11.190 inhabitants

**Irpinia—23/11/1980**
- Magnitude: 6.9
- 2735 victims
- Municipalities damaged: 506
- Largest town: Lioni → 6.410 inhabitants

**Umbria-Marche, 26/09/1997**
- Magnitude: 6.1
- 11 victims
- Municipalities damaged: 46
- Largest town: Nocera Umbra → 6.084 inhabitants
For the first time since 1908, when more than 86,000 people died during the earthquake that struck Messina and Reggio Calabria, a strong seismic event has had its epicentre in a large Italian city, rich in cultural heritage to be preserved and with a densely populated city centre.
The reconstruction strategy: avoiding containers to avoid new slums

The use of containers during previous emergencies in Italy has often showed that, although conceived as temporary solutions, these shelters ended up becoming permanent, sometimes creating new “slums”

**TRADITIONAL STRATEGY**

- **SHORT TERM**
  - Tents
- **MEDIUM TERM**
  - Pre-fabricated shelters
- **LONG TERM**
  - New houses

The Italian Civil Protection Department has thus decided to use a completely new strategy, passing directly from tents to high quality houses built with new technologies

**ALTERNATIVE STRATEGY**

- **SHORT TERM**
  - Tents
- **LONG TERM**
  - High quality new houses
Respecting different identities in the reconstruction process. C.A.S.E. and MAPs

A) City of L’Aquila → CASE Project

Building new neighborhoods in 19 different areas in order to avoid creating a “new town” and to maintain the identity of the city

Total cost: € 819,320,194

B) Other villages or former municipalities of the L’Aquila Province → MAP Project

Opting for small groups of houses in numerous areas in order to let people remain in the areas where they used to live and to which they feel they belong to

Total cost: € 85,096,000
The **C.A.S.E. Project** aims at building **4 500 new apartments**, organized in **183 buildings**, in order to host **18 000 people** having lost their own flats.

The first houses have been consigned to people on **September 29th 2009**.

By now, **3.700 apartments** have been completed and **11.666 people are already living in the houses** of the CASE Project.

Although being called temporary, the qualitative features of the houses are as high as the ones of permanent buildings, and they are **earthquake proof and environmentally friendly**.

As for the location, **19 areas** have been identified in cooperation with the city planners of the municipality of L’Aquila and taking into account their proximity to damaged areas, the risk of hydro-geological and environmental disasters.
C.A.S.E: the technology behind the project

The superstructure is seismically isolated moving horizontally in every direction

In case of seismic events, even if very strong, the structure does not suffer from any damage

The cost of repairing buildings after an earthquake is almost eliminated
Building CASE in 80 days: the area of Bazzano

1. Beginning of June 2009

2. June, 26th 2009

3. September 29th 2009 → 400 apartments delivered
B) The so-called MAPs – Temporary Wooden Houses

The so-called MAPs are temporary houses that will host more than 6,000 displaced people, whose houses have been seriously damaged by the earthquake.

In particular, over 2,000 modules are being placed in the 57 villages other than L’Aquila that have suffered from the seism, while 1,113 houses are being built in some neighborhoods of the city of L’Aquila that used to be independent municipalities in the past.

The modules are very resistant and safe; their size can vary on the basis of the needs of the family hosted and of the characteristics of their geographical area, as well as the techniques chosen and the materials used to build them.
Comparing costs... and quality

CONTAINERS

Average cost per square metre: € 360

The price includes air conditioning and basic furniture but not the costs for thermic isolation and for electricity, sewerage system and street facilities. The container has standard measures (12 m x 3 m).

Since life in a container can be acceptable only for some months, it needs to be replaced by higher standards accommodation, whose cost has to be added to the one of the container (such as wooden houses, worth € 700 m2).

TOTAL COST

€ 360 + 
€ 700 = 
€1070
Wooden Houses - MAPs

€ 760: cost per square metre

€ 70: average cost of the basement per square metre

€ 170: average cost of street facilities, electricity, heating system, ...

€ 210: cost of the furniture

TOTAL COST → € 1.210
**CASE Project**

**€ 1.283:** Average Cost of the apartments per square metre

+ **€456:** seismic isolation technologies including also the pillars and the covered parking space

+ **€38:** cost of the seismic isolator itself

+ **€ 650:** parks and gardens, measures to make the flats accessible to disabled persons

**TOTAL COST → €2.428**

including seismic isolation, electricity, heating, parking places, gardens and green areas, ...
Reopening the schools: the so-called MUSPs

The so-called MUSPs are temporary buildings substituting the schools that have been damaged or destroyed by the earthquake.

They are prefabricated structures able to resist to difficult weather conditions (1.500 meters of altitude).

Starting from September 21st, all the 17.567 students living in the area damaged by the earthquake have been able to go back to school.
The new building hosting the Academy of Music of L’Aquila, whose previous premises had been seriously damaged by the earthquake, has been opened to the public on December 22nd, 2009. The structure can host 800 students and 100 teachers. Japan has offered to realize the Conference Hall and the project has been presented during the opening ceremony of the Academy.
The contribution of a recovery process to sustainable development and reduction of risks: some lessons learnt

1) A natural disaster provokes a strong economic shock. However, the recovery process can be used for fostering territorial development and stimulate the economy, while developing new technologies and solutions.

2) The experience acquired can be used to avoid repeating the mistakes made in the past and to build a resilient and informed community, involving the population and local authorities in the decision making process.

3) What is built in the post-emergency phases needs to be different from the past and be a good example of eco-friendly and disaster-safe architecture.
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