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Lack of spatial resilience in a recovery process: Case L'Aquila, Italy

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ABSTRACT

The lack of coordination between government agencies, involvement of the collaboration networks existing in the community, and incorporation of spatial planning in the location of the new settlements around L'Aquila (Italy) after the 2009 earthquake has delayed reconstruction of the city centre. The displaced population was relocated to 19 new settlements. These new settlements are characterized by a lack of urban facilities. The aim of this paper was to analyze the relationship between urban facilities, collaboration networks and lack of spatial resilience in the recovery process in L'Aquila. Specifically, we focused on the preferences of inhabitants to search for alternative housing sites to the settlements they were originally relocated to, as a proxy for dissatisfaction in the new settlements around L'Aquila. Our approach consisted of three steps: 1) fieldwork, 2) survey and 3) correlation/regression analysis. The results demonstrated a strong relationship where preference to search for another housing site decreases with increasing number of urban facilities in the settlement and increases with travel distance to the urban core of L'Aquila. We can conclude that the allocation of facilities was oriented to supply basic services, but neglected other needs of the community during the recovery process, which reduces its resilience.

1. Introduction

On 6 April 2009 a magnitude 6.3M_W earthquake struck the Italian city of L'Aquila. The epicentre was located 3.4-km to the southwest of the city at a depth of 10-km. L'Aquila is the capital of the province by the same name and a major centre in the Abruzzo region with a population of 72,800. Its location and a map of ground motion intensity during the earthquake are shown in Fig. 1.

The historical city of L'Aquila was badly damaged, with 308 fatalities, 1500 people injured (202 seriously), 67,500 homeless (Alexander, 2010a), and about 100,000 damaged buildings. The cost of the damage to buildings/infrastructure was estimated to be 16 billion Euros (UNIFI, 2010). Reconstruction programs such as, Complessi Antisismici Sostenibili ed Ecocompatibili (C.A.S.E) and Moduli. Abitativi Provvisori (M.A.P), constructed housing units for the homeless population in 19 new settlements distributed in various locations on the outskirts of the city: Sant'Antonio, Sant'Elia, Coppito 2, Sant'Elia2, Gignano, Coppito 3, Bazzano, Sassa, Pagliare di Sassa, Paganica Sud, Cese di Preturo, Paganica 2, Tempera, Roio Poggio, Roio 2, Collebrincioni, Camarda, Assergi 2, and Arischia (Contreras et al., 2013). In the C.A.S.E project 11,776 displaced residents from L'Aquila were resettled, while in the MAP project 2468 were resettled. 4276 were receiving a special economic contribution for housing, while 478 were paying rent at special rates (Ambrosetti and Petrillo, 2016).

The location of these new settlements is shown in Fig. 2.

The main criteria for new relocation sites normally are: low hazard risk, closeness to infrastructure and land tenure ownership (Davidson et al., 2007). Nevertheless, this expensive housing resettlement solution was located in conservation lands or farmland (Alexander, 2010b). They were located in isolated places far from the core city of L'Aquila with problems such as lack of urban facilities (e.g. churches, schools, pharmacies, post offices, supermarkets, social centres, sport centres), lack of spatial connectivity (Contreras et al., 2013), social fragmentation (Ambrosetti and Petrillo, 2016; Geipel, 1979; Forino, 2014) and functional living, and questionable ecological values (Alexander, 2010b; Özerdem and Rufini, 2013). Some of the resettlements have been abandoned due to these reasons, the reduced size of the apartments and their condition, despite their recent construction in 2009 (Spalinger, 2016). The Italian State is the owner of the land. This artificial resettlement 'sprawl' did not consider either the social or spatial characteristics of L'Aquila, or its centuries-old relations between the historical centre and its surrounding neighbourhoods (Forino, 2014; Özerdem and Rufini, 2013). Additionally, the mismanagement and the slowness of the institutions due to political issues (Arens, 2014; Vale and Campanella, 2005) delayed the allocation of financial resources for the reconstruction, impairing livelihood functioning (UNU-EHS et al., 2013).

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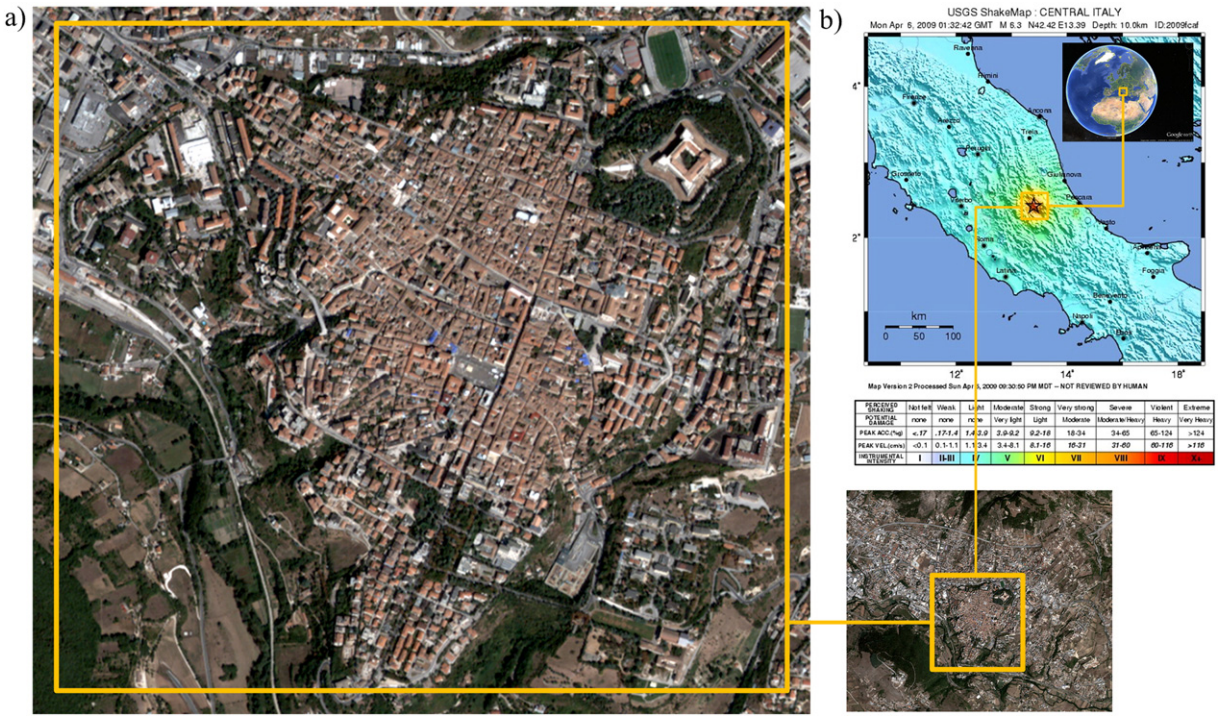

Fig. 1. Case study area: L'Aquila (Italy). (a) Location. Source: Google Earth – *QuickBird/DigitalGlobe*, distributed by European Space Imaging on 11 September 2011. (b) Map of the ground motion intensity during the earthquake in L'Aquila. Source: USGS.

There is no agreement on the definition of 'recovery' from a disaster due to natural phenomena. In the context of this paper, recovery is defined as: a complex multidimensional long-term process involving planning, financing, decision making and reconstruction aimed at restoring sustainable living conditions to a community or an area, strongly influenced by vulnerable conditions in the physical, social, economic, institutional, cultural and ecological dimensions that existed prior to the event. Other than reconstructing buildings and infrastructure, the recovery process must also address the interaction among a variety of groups and institutions, with the aim to rebuild people's lives and

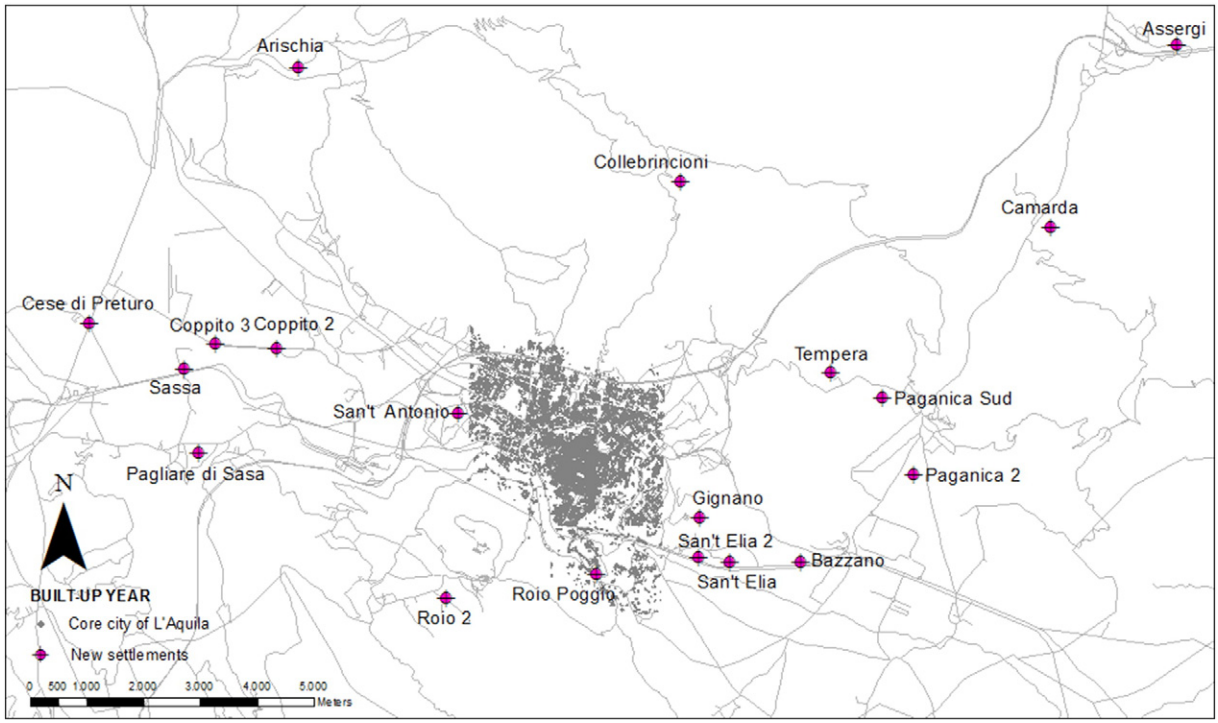

Fig. 2. Location of new settlements, inner city and old town in L'Aquila . Servizio per L'informazione Territoriale e la Telematica – Ufficio Sistema Informativo Geografico – Regione Abruzzo. MICRODIS Project – Commission's Sixth Framework Programme.