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The role of open space for urban resilience: A case study of San Pedro de la Paz under the context of the 2010 earthquake in Chile.

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Abstract

After the scale and impact of the 2010 earthquake and tsunami that occurred in Chile, open space became an essential element during the emergency. This, when the affected population quickly occupied all open space –unbuilt space– as safe areas, and later, as places to accommodate a diversity of urban activities. The former, under the context of an urban system that froze for several days, isolated and without basic services leaving a toll of over 100,000 affected families, from which half, resulted with their homes inhabitable. From this experience, open space can be seen from a new scope: as an asset for urban resilience. This understood as an element with latent capacity that can assist the urban system to absorb shock and respond to change without losing its structure and identity. However, despite this revelation, planning instruments in Chile still unvalue open space and are left both marginalized and taken as extra-mural or considered as little as marketable assets expectant to any demand of urban growth.

As a response, this article discusses the implications of an exploratory study about the occupation of open space in the 2010 earthquake in the city of San Pedro de la Paz (urban area within the Metropolitan Area of Concepcion) under a resilience framework. Where by resilience variables (Walker and Salt, 2006) related to urban theory (Allan and Bryant, 2010) a deepen integration of open space and urban design can be possible in reconstruction plans. Thus open space can contribute not only significantly to the quality of urban life but as an essential life support and recovery agent in case of a seismic event.

The research aims to examine the particular nature and morphology of the occupied open spaces from attributes of urban resilience related to urban design in order to recognize certain contents for planning and design. As methodology, three stages were performed: The first identified all occupied open spaces through a survey compiled from interviews with municipal authorities and neighbours together with websites and social networks reviews. That was later spatially registered and catalogued under typologies, disaster response and time of use. The second analysed the identified open spaces under the variables of resilience that relate to urban design (Rodriguez, M.T., Wirsching, C., Garcia, D., 2014) these as: Diversity, Modularity, Ecological

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Variability and Ecosystems Services. Diversity, related to the typologies of open space, where the capacity of diverse responses to diverse situations is resilient. Modularity, related to the permeability and redundancy of the urban structure, where a resilient network would keep functioning when a module fails. Ecological variability related to environmental fluctuations, where resilience allows it as opposed to reduced and control it. Aspect observed in natural open spaces such as border of lagoons and wetlands. At last Ecosystems Services, related to open spaces that provided services such as water for transient occupancy. Contents if contained in open space can assist urban resilience. Concluding with a third stage, where results of the first and second were combined to produce a design of an open space network that could contribute to the urban resilience of San Pedro de la Paz. This resulted in the form of a recreational public circuit. By the selection of significant used open spaces according to their individual and integrated ability to promote resilience under the four variables while attending the emergency functions of evacuation, transient occupancy and environmental fluctuation. All integrated under a modular and permeable layout determined through flood plans, land uses capacity and existing circulation. At last, the inclusion of built elements, as space for reorganization and safety.

As a result from all three stages important data on the value of open space in San Pedro de La Paz (SPLP) and conclusions on elements for the design and planning of seismic cities were obtained. Even more when SPLP - unlike other urban areas within the metropolitan area- exhibits great quantities of open space and of different nature that allows developing and enhancing on urban design with resilience content. This as the following:

- The relationship between open space, resilience and urban design constitutes an integral way to be incorporated into urban planning and design for resilient cities subject to seismic events.
- Occupied open spaces were revealed to be of diverse type revealing the need of open space to be a public good and/or of collective property when planning and designing for reconstruction plans.
- The variables of resilience related to urban design can only contribute to urban resilience when viewed and integrated in a systemic methodology. Thus, the designs of a network open system.
- If open space is thought and included as an urban asset for seismic cities under a resilience framework, not only can we achieve a more adaptive urban configuration, but we can also restore the balance between development actions and environmental protection.

Keywords: open space, urban resilience, urban planning and design, earthquake, tsunami.

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Camila Wirsching Fuentes, Architect by the University of Concepcion, Chile. Postgraduate Diploma in Sustainable Urban Design by the University of Bio-Bio, Chile. Currently MSc © in Urban Regeneration and Development from the University of Manchester. Has worked for NGOs (America Solidaria and Un Techo para Chile), for the private sector (Consortium Valdivia Sustentable, Chile) and the public sector (reconstruction and public space programmes from the Ministry of Housing and Urbanism, Chile). Co-founder of Biobioprojecta (<http://www.biobioprojecta.org/>) and NGO CEGECIS (<https://www.facebook.com/cegecis>).

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