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## Contain, restore, connect: landscape as infrastructure

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Urban rivers have historically posed important challenges for urban planning in Chilean cities, especially when their physical presence has been accompanied by unstable and changing hydrological regimes, as occurs in the rivers of North and Central Chile given the seasonal torrent condition which generally characterizes them. From the first canalizations and embankments built during the colony and the first republican decades, to the current fluvial defenses, infrastructures and public spaces projected around their banks, rivers have demanded a constant attention of diverse technical fields for their domination and use. Additionally, the contemporary panorama presents new challenges that not only refer to a technical operational dimension, but to a cultural and environmental conception that – from intellectual, citizen and political spheres – determines the need for a more integral approach towards the management of urban rivers as complex socioecological systems,<sup>1</sup> in a growing state of vulnerability as a result of the anthropic activities derived from industrialization and urban expansion processes taking place over the last few decades. Critically, the deterioration of the beds, banks and ecosystems of urban rivers have compromised their capacities to contain the occurrence of floods and alluvions, which increasingly affect neighboring territories and communities.

Copiapó River constitutes a paradigmatic example that expresses in its recent history several of these problems. In a period of just over 30 years, due to the systematic exploitation of water for the development of the mining industry, the traditional landscape of its banks, articulated by riparian vegetation, agricultural crops and recreational uses, was replaced by a sequence of extractive works, debris deposits and mining tailings. In this scenario, from 2011 the Kaukari Park project began to be developed by Teodoro Fernández Arquitectos. Throughout its 60 hectares, the Park aims to recover the Copiapó River as a public space, hydrological system and green corridor, through the design of riverside walks,



terraced squares, revegetation of banks and tree lines, with special attention to the use of suitable species to survive in arid contexts and materials coherent with the aesthetics and culture of the desert. In formal terms, one of the most remarkable aspects is the configuration of diverse connections to access the river bed, through ramps, stairs and slopes, offering an experience that revitalizes the ancestral relationship of the communities with the river, this time in a context of urbanity that reclaims it as a public space.

In March 2015, heavy rainfall generated an unprecedented increase in the waterflow volume of Copiapó River, equivalent to a return period of more than 100 years, accompanied by several alluvions that affected the city. The phenomenon to which Kaukari Park was exposed redefined the scope of this project and the disciplinary responsibility of landscape architecture itself, in terms of its contribution to risk management and urban resilience.<sup>2</sup> Transcending the accessory operations that concur in landscape and public space projects in regional cities, Kaukari highlights the value of essential operations that, as various authors point out, converge on the idea of landscape as infrastructure.<sup>3</sup> It is here, in this discussion about what is strictly necessary, that one can make the choice of a landscape design approach that can prevail facing scenarios of changes, vulnerabilities and disasters. From this perspective, a landscape is revealed as a potential territorial infrastructure, generating adaptive capacities through projects that allow the articulation of natural and anthropic systems, the evolution of its components over time and the development of flexible programs, which can still promote the evocation of its aesthetic and cultural values. **ARQ**



## Notas / Notes

- 1 A socio-ecological system describes a complex territorial system, formed by the combination of anthropic and natural elements that establish a hybrid ecological dynamic, where social and environmental variables interact. (Ostrom, 2009).
- 2 In general terms, the concept of resilience refers to the ability of a system to adapt to the changes that occur in a given context and assume flexibility in extreme situations, to overcome them (Kreimer et al., 2003; Vale & Campanella, 2005; Moreno, 2013).
- 3 Under this perspective, the landscape and its components can be understood as a potential structuring network of the territory and the city. Several authors (Belanguer, 2017; Waldheim, 2016; Corner, 2014; Reed & Lister, 2014; Hung, 2011) discuss the role of Landscape as Infrastructure of the territory.

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