

## SUSTAINABILITY AND WATER SENSITIVE CITIES: ANALYSIS FOR INTERMEDIARY CITIES IN ANDALUCIA

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There is currently a phenomenon of global urbanization, where in Europe the intermediate cities play a leading role by concentrating more than 40% of the European urban population. These types of cities have specific challenges regarding their sustainability and are key to meeting the objectives included in the 2030 United Nations Agenda due to their local character and proximity to the citizen. These types of cities have a great value, given their condition of intermediation spaces between the rural and the urban habitats. They are a crossing where the water, energy and food nexus influence in a capital way.

Among the previous elements, water is the only natural restriction to the expansion of cities, and appears as the only natural limit to their economic growth and development. Urban water becomes a key natural asset in the sustainability of the city. Concepts associated with its management appear as "Water Smart Cities" or "Water Sensitive Cities".

On the other hand, these intermediate-sized urban poles have a high impact on how the supply chains of products are established, from rural areas to the coast, to metropolises and to peripheries and, therefore, are the determining local consumption and production patterns to achieve sustainable urban development. In this way, their citizens play a crucial role, since the resilience of this type of city is based on the strength of its identity, its culture and its defense of diversity. Sustainable development and the role of the citizen in its achievement are presented as one of the key nexus for these types of cities.

The intermediate cities of Andalusia in Spain, its urban sustainable development and its relationship with water, the objective of the analysis in this article, the analysis through the winning plans in the first call of the "Integrated Strategy for Sustainable Urban Development" (ISUDS, or EDUSI in Spanish). In this process, citizens are the main actors through their participation in the elaboration of the ISUDS, in which they express the scope of the "hydro-social contract" of the citizenship. The article analyzes the latter through a methodological framework applied to the ISUDS, which shows the unequal interest of Andalusian intermediate cities when integrating water into their sustainable development. The article ends with a series of recommendations that make it possible to bring these cities closer to the "water sensitive cities" stage.

## REFERENCES

- [1] Pilar Martinez, Maria Blanco and Bente Castro-Campos. The Water–Energy–Food Nexus: A Fuzzy-Cognitive Mapping Approach to Support Nexus-Compliant Policies in Andalusia (Spain). *Water* **2018**, *10*, 664.
- [2] R. Brown, N. Keath and T. Wong. Transitioning to Water Sensitive Cities: Ensuring Resilience through a new Hydro-Social Contract. 11th International Conference on Urban Drainage, Edinburgh, Scotland, UK, **2008**.
- [3] Habitat III. The United Nations Conference on Housing and Sustainable Urban Development. Available on line <https://unhabitat.org/habitat-iii> (accessed on 28 March 2019).
- [4] Chefchaouen Declaration-Charter of the Intermediary Cities of the World. 1st World Forum Intermediary Cities. Chefchaouen, Morocco. **7 July 2018**. Available on line [https://intermediarycities.uclg.org/sites/intermediarycities.uclg.org/files/2018-07/EN\\_Declaration%20Charter%20of%20Intermediary%20Cities%20of%20the%20World.pdf](https://intermediarycities.uclg.org/sites/intermediarycities.uclg.org/files/2018-07/EN_Declaration%20Charter%20of%20Intermediary%20Cities%20of%20the%20World.pdf) (accessed on 28 March 2019).
- [5] F.J. de Haan, B. C. Ferguson, R. C. Adamowicz, P. Johnstone, R. R. Brown and T.H.F. Wong. The needs of society: A new understanding of transitions, sustainability and liveability. *Technological Forecasting & Social Change* **2014**, *85*, pp. 121-132.
- [6] A.J. Dean, J. Lindsay, K.S. Fielding, L.D.G. Smith. Fostering water sensitive citizenship – Community profiles of engagement in water-related issues. *Environmental Science & Policy* **2016**, *55*, pp. 238-247.
- [7] State Official Gazette. Number 275, **Tuesday 17 November 2015**, Sec. III. Page 108082. Available on Spanish: “Boletín Oficial del Estado (BOE)”.
- [8] Farrelly, Megan Anne, and Rebekah Ruth Brown. Making the implicit, explicit: time for renegotiating the urban water supply hydrosocial contract? *Urban Water Journal* **2014**, *11*, 5.
- [9] Tim van Hattum, Maaïke Blauw, Marina Bergen Jensen, Karianne de Bruin. Towards Water Smart Cities. Report number 2787 of Wageningen Environmental Research (Alterra), **2016**.
- [10] Urban Initiatives Network. Available on line (in Spanish) <http://www.rediniciativasurbanas.es/convocatoria-de-ayudas/estrategias-dusi> (accessed on 28th March 2019).
- [11] State Official Gazette. Number 239. **Monday 3 October 2016**. Sec. III. Page 70761. Available on Spanish: “Boletín Oficial del Estado (BOE)”.
- [12] State Official Gazette. Number 121. **Monday 22 May 2017**. Sec. III. Page 41660. Available on Spanish: “Boletín Oficial del Estado (BOE)”.
- [13] C. Chesterfield, C. Urich, L. Beck, K. Burge1, A. Charette Castonguay, R.R. Brown, G. Dunn, F. de Haan, S. Lloyd, B. C. Rogers, T. Wong. A Water Sensitive Cities Index - Benchmarking cities in developed and developing countries. *Conference Paper June 2016*.
- [14] Buurman, J. and Padawangi, R. Bringing people closer to water: integrating water management and urban infrastructure. *Journal of Environmental Planning and Management* **2017**, *1-18*
- [15] Briony C. Ferguson, Niki Frantzeskaki, Rebekah R. Brown, A strategic program for transitioning to a Water Sensitive City. *Landscape and Urban Planning*. **2013**. *117*, 32– 45.
- [16] Lindsey Beck, Rebekah R. Brown, Chris Chesterfield, Gemma Dunn, Fjalar de Haan, Sara Lloyd, Briony C. Rogers, Christian Urich, Tony Wong. Beyond benchmarking: a water sensitive cities index. *Conference Paper May 2016*.
- [17] C.P. Alderfer. An empirical test of a new theory of human needs. *Organizational Behavior and Human Performance* **1969**. *4*, 2.
- [18] Yolande Strengers. Smart Metering Demand Management Programs: Challenging the Comfort and Cleanliness Habitus of Households. *Proceedings of the 20th Australasian Conference on Computer-Human Interaction: Designing for Habitus and Habitat* **2008**. 9-16.