

RIVER-CITY SYSTEM: A METHOD TO ASSESS URBAN CONFIGURATION

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River landscapes represent a distinguishing fragile equilibrium between natural and human induced elements. Natural elements and urban structures (as a network of buildings and infrastructures) constitute the physical environment within which people act. Therefore, three components have to coexist: river ecosystem, urban structure and people; the latter act as a joining element between the first two.

Mutual relations among these three main factors have progressively determined urban development of areas located nearby water courses. Given the said relations, a properly preliminary evaluation of river-city relationship is needed designing urban river contexts, regarding river ecosystem as well as urban structure and its users.

City-river relation can be deduced starting from evaluating river basin hydraulic and geomorphological features, dimension and urban physical structure of riverine settlements, at different territorial levels (Silva J. B. et al, 2006).

Quantitative spatial analysis can contribute to overall describe people component and how it interacts with river landscapes. Belonging to the field of configurational analysis, Space Syntax technique is mainly aimed at evaluating centralities measures defined on the basis of urban space perception. Urban configuration is then analysed from a syntactic perspective and defined as a set of mutual relations among all spaces of the urban systems.

Starting from river-city relations measures described in (Silva, J. B. et al, 2006), a broader framework is here presented including configurational based indexes too. Proposed syntactic indicators will be evaluated for three river-cities case studies through Space Syntax approach, pointing out similarities and differences. These measures have been conceived to help in assessing in which measure city structure is actually perceived as integrated with its river streams, in spatial and functional terms.

The use of urban space in river cities results from a mix of geographical, cultural, social, historical and psychological issues. Therefore, configurational analysis could contribute to a complete estimation of river inclusion within city layout and its implication on city behaviour. A deep knowledge of river role from a functional perspective represents the basic step in dealing with riverine urban areas: it results significant trying to define probable effects related to whichever (structural and non structural) measure within river cities systems.

References:

Hillier B., Penn A., Hanson J., Grajewski T., Xu J., "Natural movement: or, configuration and attraction in urban pedestrian movement.", *Environment and Planning B: Planning and Design*, vol. 20, 1993.

Hillier B., Vaughan L., "The city as one thing.", *Progress in Planning* 67(3), pp. 205-230. 2007

Nilufar F., Hossain L., Jinia M.A., "Integrating land with water routes: Proposal for a sustainable spatial network for Keraniganj in Dhaka.", *Proceedings of the 9th International Space Syntax Symposium*, Seoul. 2013

Silva J. B., Saraiva M.G., Ramos I. L., Bernardo B., "Methodology of aesthetic evaluation of rivers in urban context.", *Proceedings of Urban River Rehabilitation Conference*, Dresden. 2005.

Silva J. B., Serdoura F., Pinto P., "Urban rivers as factors of urban (dis) integration.", *42nd IsoCaRP Congress*. 2006.