

## **SUSTAINABLE CITIES BY BUILDING INNOVATION**

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**Abstract.** *Cities of the future should face and win the challenge of planning and designing an approach to sustainability as source for creating public value and benefit the economic and urban development. The 'Helices' offer an opportunity for cities willing to contribute to innovation and to sustain social and economic development of territories for improving both the economic and social performances for business and help the quality of life for citizens and people living within urban communities.*

**Keywords:** *sustainability; cities; helices; innovation.*

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## **1.INTRODUCTION**

In societies and economies knowledge and service driven and oriented to create by innovation new knowledge and public value cities have the opportunity to plan and build a sustainable future relying on innovation and discovering adequate relationships by involving industry, universities, citizens, people and associations within community and society. Cities as social organisms and ecosystems provide services infrastructures for citizens and businesses by shaping economic systems and designing social, cultural and economic development and growth for urban and regional areas and communities. The ‘Helices’ model tends to emerge as theoretical perspective and organizational framework for cities as ‘smart oriented’ organisms strategically driving innovation in providing services, building material and immaterial infrastructures in order to support growth in urban areas. Sustainable development of cities ‘smart oriented’ seems to rely on following the model of the ‘Helices’ as driver for sustaining innovation (Afonso, Monteiro & Thompson, 2010; Carayannis, Barth & Campbell, 2012; Deakin, 2014; Etzkowitz & Leydensdorff, 1998; Etzkowitz & Zhou, 2006; Leydensdorff & Deakin, 2011). The aim of this study is to elucidate how cities can select and build by innovation a path towards sustainability relying on the ‘Helices’ configuration emerging in urban and regional areas. This study relies on archival and qualitative data drawn by considering and analyzing the literature on the ‘Helices’ model as driver and source of innovation.

## **2.TOWARDS SUSTAINABLE CITIES**

Cities are social organisms and expression of human capacity for driving meaningful communication, social entities displaying both internal and external forms of symbiosis and symbolic communication between individuals (Schnore, 1971). Cities as sustainable ecosystems are becoming the principal engines of economic growth and places where to produce goods and services in the twenty-first century (Newman & Jennings, 2008). Sustainable cities tend to continuously change as living and evolving organisms and learning systems oriented to create knowledge and to produce innovation by sustaining creative and morphogenetic processes over time. Cities are places for building social interaction, a locus for engendering creativity as entities sustaining, improving and extending the wealth of people within community (Camagni, 1996). Cities tend to act and behave as sustainable and

knowledge based forms of organization that develop structures and practices for encouraging the creation, the use and the sharing of knowledge in relation to social, economic and environmental issues (Leon, 2013). Cities tend to behave social organisms involving citizens and associations to build community and social innovation by sustaining creative-led policies and developing cultural and creative activities by encouraging participation and sharing of values and knowledge (Montanari and Mizzau, 2015). Cities as services providers and meeting places for sustaining learning and education, culture and politics, emerge as the main social incubators for driving change and creating social and economic innovation (Evans, Joas, Thundback & Theobald, 2005). A sustainable path driving cities to survive as proactive, economic and social organisms relies on cities capable to build a social change and develop by promoting technological infrastructures for developing social and public value (Williams, 2009).

### **3. DEVELOPING INNOVATION WITHIN CITIES: THE ROLE OF THE ‘HELICES’**

Cities as key actors in shaping the urban and regional development should select the ‘Helices’ (‘Triple’ or ‘Quadruple’ and ‘Quintuple’ ‘Helix’) as organizational and strategic framework in order to support and govern processes of innovation and new knowledge creation. The ‘Triple helix’ model emerging by the interaction, the dialogue and search for cooperation among university, industry and government is considered the key for searching for innovation in knowledge-based economies and societies (Etzkowitz & Leydensdorff, 1998). Etzkowitz and Zhou (2006) refer to the attribute of sustainability as complement to innovation in order to support the creative dynamic of ‘Triple Helix’ model. Knowledge and innovation policies and strategies tend to acknowledge the important role of the ‘public’ for successfully achieving goals and objectives (Carayannis & Campbell, 2009). Afonso, Monteiro and Thompson (2010) suggest to consider the civil society as the fourth pillar or helix dialoguing with technological infrastructure of innovation and influencing the economic structure of countries. Cities as key components of innovation systems and engines of economic growth are considered and viewed as densities in networks among three relevant dynamics: the intellectual capital of universities, industry of wealth creation and their participation in the democratic government of civil society. The perspective offered by ‘Triple Helix’ model seems to explain how the cultural development relies on developing policies in which governing and local authorities play a relevant and central role in contribution to constructing them. Cities planning to become smarter organizations need to acquire the intellectual capital

required as centers of creative slack because of communities exercising a political leadership and selecting strategies opening up to the economic and governmental dimensions of corporate management (Leydesdorff & Deakin, 2011). Three helices operate in a complex urban environment, where market demand, governance, civic involvement and citizens' characteristics, along with cultural and social capital endowments shape the relationships between the traditional helices of university, industry and government. This perspective tends to emphasize the role of cities as 'smart' and incubators of intellectual capital, enabling the creation of wealth and regulators of standards by involving universities, industry, government and civil society as one of the main key actors in promoting the development and performance of cities being smart (Lombardi, Giordano, Farouh & Yousef, 2011). Cities following the 'Triple Helix' model tend to become smart entities and organisms developing democratic and participatory governance (Deakin, 2014).

#### **4. CONCLUSIONS**

In the future cities will have to face the challenge to plan and select a strategic approach to sustainable development of urban and metropolitan areas as engine of social and economic growth and driver for the wealth of communities and territories. Cities proceeding towards a sustainable development become aware that the success or the defeat of building a path for sustainability will depend on the capacity of the cities to mobilize all the human, technological and knowledge resources they have at disposal. Cities should develop a sustainable path promoting a social change by developing technological and knowledge infrastructures and sources for innovation (Williams, 2009), paying attention on considering the social dimension of the city as community growing through using and sharing knowledge for creating innovation. Technological, financial and human resources are not enough without a strategic design addressing the project and the processes, driving communities, organizations, businesses and civil society to cooperate for producing better solutions to emerging problems and selecting appropriate choices and policies sustainability oriented. The 'Helices' offer a relevant theoretical framework, a valid organizational and operational pattern for understanding a satisfying way for building and sharing knowledge for engendering innovation driving cities to proceed towards sustainability.

The main contribution of this study is to identify a pattern to describe an evolutionary path that cities can follow for building a sustainable development oriented to work for continuous innovation. There is no a best way for cities aspiring to proceed towards

sustainability by analyzing the issues emerging in the literature appreciating the role and value of the ‘helices’ models. There are different trajectories leading cities to select and follow a strategic approach sustainability-driven. Cities can plan the future only by adapting patterns of development or paying attention on the potential of innovativeness as to create innovation in the model of urban development. Cities considering not only triple helix but quadruple and quintuple helices as pattern for building innovation as sustainable routine tend to advance and design the future as evolving organisms proceeding towards urban and economic development. It is necessary to consider the social dimension of communities involved in debating the proposals and cooperating with the classical triple helices to offer more solutions shared and socially accepted in the path leading cities to develop. Cities should design networks involving businesses, university, government, citizens, associations, intermediary bodies in order to define a strategy innovation-oriented by using knowledge for enlarging and strengthening the sustainability as source and public value for helping the development of communities and society.

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