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**Towards an Inclusive,
Safe, Resilient and
Sustainable City:
Approaches
and Tools**



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EDITORIAL

Luigi Fusco Girard

1. From the city as a problem to the city as an opportunity

The city represents the place where one of the most considerable mega-trend of the new millennium is happening: the urbanization process, with its environmental, social, economic, cultural impacts. Here the national/regional wealth is produced. The city represents the engine of economic growth of a region, of a country; it is the place where productivity, capability to introduce innovations and to economize resources are higher. The city is more and more considered as the centre of national development policies: where the urban, environmental and economic issues are closely intertwined. But here previous agglomeration economies often turn into many diseconomies. The city is becoming also the place where poverty, social segregation and fragmentation of relationships are concentrated and where environmental pollution is higher. However the city is increasingly considered as an “attractor of hope”. It is a “laboratory”, that is the place where the future of 21st century society is going to be built: where the city capability to attract investments, creative activities, talents, people in a context of growing competition with other cities in the globalized economy appears more evident.

What future? What development? What quality of life? How to improve the existing conditions? Which strategies, approaches and tools to make more “human” the evolutionary dynamic of the city?

2. Towards a new urban paradigm

A more general question derives from the recognized unsustainability of the current city organization: what new urban paradigm to improve the quality of life, to achieve generally more desirable conditions, to make more human the evolutionary dynamic of the city?

Some general principles of the new urban paradigm are outlined by the Open Working Group on Sustainable Development Goals, appointed for reformulating the objectives of RIO + 20 - The Future We Want as the basis for the new UN Development Agenda beyond 2015. In September 2014 a totally new goal (n. 11, that is the “city goal”) has been introduced in those of the post-2015, for making cities “inclusive, safe, resilient and sustainable”.

Social inclusion is the capability to reduce/eliminate segregation, exclusion, marginalization, etc., forms (through the provision of specific spaces for all the subjects of the urban community, etc.); resilience is linked to the capability to regenerate significantly the resources that are used for the functioning and that the city consumes (water, energy, soil, etc.) through reuse, recycling, regeneration, transforming the linear metabolism into circular one, imitating the functioning of natural ecosystems; sustainability (in economic dynamic) is the capability to produce new economic wealth, minimizing negative impacts on the environment; safety can be interpreted from the point of view also of the health of people and environment and the security of goods.

3. Moving toward a New Urban Agenda

We are moving toward a New Urban Agenda. After the Meeting in Istanbul (1996) and the proposal of the Habitat Agenda, UN Habitat has identified a set of principles for moving towards a new urban paradigm, characterized by the “human scale” of the city development.

We can interpret this general goal as the capacity to concretely implement the human rights in the city system. Human rights to health, work, education, housing, services, good environment etc. and human scale of development are interdependent. Through human rights implementation, resilience, social inclusion, cultural identity, health, economic sustainability/prosperity are enhanced.

Are the above principles enough to give new shape to the city, and to promote the “human scale” of urbanization: to give a different form, less dis-human, to the development of the city, seen as the place where the relational dimension of humanity is achieved? To realize the “city of relations” (between centre and periphery, between built fabric and suburban territory, between inhabitants, between people and institutions, between city and nature etc.), where relations become systemic bonds able, in their turn, to generate new chains of value creation, through synergies, symbiosis and circularization processes?

4. How? Which tools?

Work is a general engine for building relations and bonds, and for making the city more inclusive, safe, resilient and sustainable.

This issue of BDC aims to promote a reflection not much on the general criteria and principles, but above all on the tools that should be acquired.

Urban planning, urban design, local finance are some examples of tools for achieving a more just, regenerative, safe and prosperous city. The city prosperity depends on its attractiveness. It can be enhanced through planning/design.

In particular, the question is: how and through which tools is it possible to move from principles to their concrete fulfilment to improve the attractiveness of the city, which depends on its infrastructure and technological, economic, social, environmental and cultural equipment in the growing shortage of local resources, due to the reduced financial/fiscal capability?

Of course, the questions multiply: for example, how to “capture” a rate of generated real estate plus values? How to integrate bottom-up, through crowd-founding processes, the local financial base in the view of specific local projects?

5. Towards operationalizing HUL to make “inclusive, safe, resilient and sustainable cities” through attractiveness capacity

The main objective of BDC issues is to document the activities of Calza Bini Research Centre - International Laboratory on Creative and Sustainable City in developing practical means to achieve sustainable and inclusive human development in cities. The entry point is here the use of historic/cultural landscape/heritage as key asset.

Currently, the Historic Urban Landscape approach is only a theoretical approach, since the proposed tools have not declined in their practical application.

The HUL approach is much focused on “what is to be managed and why” and not on “how”. The “how” of the HUL approach, how it can be implemented in the cities, within their specific contexts, is the key topic of a research work, for operationalizing HUL.

HUL can help more generally to integrate urban planning with other tools of urban governance for integrating urban planning tools with local financial base.

The HUL approach is interpreted in Calza Bini research activities as an effective approach to increase the attractiveness of the city/territory system, and thus to re-generate the city/territory system, to increase productivity: to stimulate urban/territorial transformations in a more creative and desirable perspective, to make the existing system more resilient and thus more competitive for achieving new opportunities and prosperity.

The city attractiveness depends first of all on existing cultural heritage sites/landscapes and their valorization. The city attractiveness depends on the relationships between open/natural spaces and man-made capital, between nature and architectural artifice/product. These relationships have shaped the city and its history and then will be central in drawing its future. The improvement of city attractiveness depends on how it proceeds to introduce technological innovations (which allow reducing impacts of pollution/greenhouse, to conserve energy, to use renewable energy, etc.): that is, it depends on the relationship between technology and culture. The city attractiveness depends on the quality of concrete operational planning tools to combine creatively particular/specific interests and the city general interest. Improvements of the city attractiveness are linked to the existence of networks of mutual support, mutual exchange, of solidarity cooperation. They involve communication, knowledge and participatory processes, towards the self-organization, self-management, self-government. The city attractiveness is enhanced through the capacity of regeneration of natural resources. But, first of all, it needs to regenerate relationships in the city physical space: between inhabitants; between inhabitants and man-made assets; between inhabitants and earth/nature; between productive activities; between cities and economic activities; between cities and rural areas.

The new urban paradigm is based on relations and links, able to generate synergies that become symbiosis able, in turn, to trigger circular processes of organization which show how coordination and cooperation are economically, socially and environmentally convenient.

6. Conclusions

The HUL approach is here put in relation with the search of the new urban paradigm: as a tool that can contribute towards the new urban paradigm characterized by a “human scale”. HUL approach is interpreted in Calza Bini – Creative City Laboratory researches as a good one to contribute to implement the symbiosis between landscape/heritage conservation and development, producing economic, social and environmental plus-values through new relations and thus opening new opportunities. In a more general perspective HUL is considered as a good approach to address urbanization processes in a more sustainable direction: to ensure “quality” to the urbanization processes, providing new principles, new visions, approaches, methods and tools. The “good urbanization” is an urbanization that should be shaped by quality: the key role of cultural heritage/landscape is that cultural urban heritage/landscape provides quality, sense and meanings to the urbanization processes, promoting the implementation of “places” as attractive spaces in the city/metropolitan areas. Cultural heritage and landscape are the memory of the urban system: the ground of its identity. They contribute to the physical assets and to “quality of life” of people.

Cultural landscape/heritage creative use can contribute to the new urban development paradigm, based on a new city structural organization: it contributes to many SDG'S, making cities more resilient, inclusive, safe and sustainable; the reduction of poverty; the city health; the regeneration of local economy (fostering innovative activities and the local creative economy) and the local employment (in particular in sustainable tourism activities/investments); the resilience of urban system and infrastructure.

Many examples and good practices can be proposed, showing that landscape and heritage contribute to the well-being, employment, social cohesion, creative activities, etc. and more in general to enhance the city attractiveness. HUL approach offers an interesting perspective to new hybridization processes for planning and developing, but it absolutely requires specific innovative tools to be implemented.

Rigorous and innovative economic evaluation methods are required to convince private, public and social actors that the integrated conservation of the cultural urban heritage/landscape is an investment and not a cost (because benefits overcome costs), offering new arguments about the inclusion in the creative local economy; the inclusion in the sustainable tourism strategies; the inclusion in the urban resilience strategies.

Economic matrix is absolutely necessary. But it is not sufficient.

Hybrid evaluation methods are needed, able to integrate quantitative and qualitative impacts. Specific evidence based indicators are to be identified, for assessing in an operational way the changes of the city landscape. Cultural heritage/landscape should be not only protected and safeguarded, but revitalized and creatively regenerated.

Through evaluation tools, it is possible to pass from general principles to operational practices, producing empirical evidence on the economic, social and environmental benefits of HUL conservation and regeneration.

All the above (and the many others) issues refer to a common problem: how to improve decision-making processes and which evaluations should be chosen and performed at different scales? How to select an appropriate system of indicators that are actually able to verify and monitor whether and to what extent the objectives of sustainability, resilience, inclusion, safety, are achieved at their best?

Many topics emerge: the potential of hybrid landscapes in the city regeneration, in the wealth city production, in the social and cultural promotion, through many examples of good practices. Good practices offer empirical evidence of the positive multidimensional impacts. They show that integrated conservation contributes to local economic development. Here some research contributions about evaluation tools are gathered.

Joe Ravetz explores methods for valuation and evaluation, which are suitable for complex inter-connected "real" systems. Urban cultural heritage sites, or urban ecosystems, often contain multiple sources of value (economic, social cultural, ecological): such value is often generated by multiple collaborations, social learning and collective intelligence, and there are multiple policy objectives and system inter-connections to be evaluated. In contrast to the normal reductive assumptions of mainstream valuation/evaluation, such highly inter-connected situations call for new methods. This paper demonstrates the "synergistic" approach to valuation and evaluation, with a practical "evaluation template", and some examples from "Greater Manchester", UK.

Giuseppe Munda introduces the concepts of "economic democracy", political democracy and evaluation frameworks, considering that in order to formulate, evaluate and implement public projects or policies, the existence of a plurality of social actors, with interest in the

options being assessed, generates a conflictual situation. In this article, Munda shows that the compensation principle was invented by Kaldor and Hicks to achieve two clear objectives: to compare individuals' preferences according to the efficiency oriented utilitarian calculus, explicitly avoiding the principle one individual, one vote; to implement an objective evaluation criterion, that could be accepted in the framework of the dominant positivistic philosophical paradigm. In the compensation principle, there is no escape from value judgements, it is not the positivistic objective evaluation criterion. A relevant question is: are the original Kaldor-Hicks objectives still relevant in the 21st Century?

Arayeh Afsordegan, Mónica Sánchez, Núria Agell, Gonzalo Gamboa, Lázaro V. Cremades present the implementation of linguistic descriptions with multi-criteria decision aid approaches in urban energy systems, considering that Multi-Criteria Decision Aid (MCDA) methods include various collections of mathematical techniques related to decision support systems in non-deterministic environments to support such applications as facility management, disaster management and urban planning. This paper applies MCDA approaches based on qualitative reasoning techniques with linguistic labels assessment. The aim of this method is ranking multi-attribute alternatives in group decision-making with qualitative labels. Finally this method is applied to a case of urban planning in selection of the less energy consumption project in a geographical area in Catalonia.

Annalia Bernardini, Ricardo Barrero, Cathy Macharis, Joeri Van Mierlo introduce the application of the Multi-Criteria Analysis (MCA) to technological solutions aiming at recovering metro braking energy in the transport sector. Indeed, the transport sector is responsible for a large share of fossil fuels consumption and emissions, mainly CO₂, and is seeking for different ways of reducing their energy consumption and, especially, their dependency on fossil fuels. This paper presents the MCA of technological solutions recovering metro braking energy by the implementation of the MCA PROMETHEE method, endorsed to select the most suitable technological solution for the tram and metro network in Brussels. The MCA approach allowed to firstly evaluate the different technologies and afterwards to propose an individual decision to the public transport decision-maker based on the decision problem objectives and the MCA results.

The paper of Lucia Rocchi, Gianluca Massei, Luisa Paolotti, Antonio Boggia presents the topic of soil instability and agricultural management, considering that land defense from hydrogeological instability is a very important topic, at both national and international level. Every year these phenomena cause huge environmental, social and economic damages. Human activities, especially in relation to land-use change and intensification of agriculture, represent one of the main factors affecting the stability of the soil. For a proper management of territory in terms of prevention and control of hydrogeological instability, to use tools that combine support to public decision-makers with spatial analysis is essential. This paper illustrates the utility of integrating Geographic Information Systems (GIS) with Multi-Criteria Analysis (MCDA) in relation to a case study of the basin Menotre, in Umbria, proposing the use of the Dominance-based Rough Set Approach, developed in GRASS GIS 6.

Marianna D'Angiolo and Pasquale De Toro, starting from the UNESCO proposal (2011) of Heritage Impact Assessment (HIA), propose a multi-criteria approach to the evaluation of five possible alternative scenarios of intervention for the UNESCO site "Amalfi Coast". The definition of the scenarios was carried out from the higher-level planning and programming in force, as well as on the basis of a SWOT analysis. The multi-criteria

evaluation, carried out with reference to specific goals and criteria, allowed us to deduce a ranking among the scenarios proposed, in particular by applying the Regime method; also a sensitivity analysis on the results was elaborated.

Antonia Gravagnuolo introduces a metodological approach for the evaluation of landscape services in terraced cultural landscapes and the proposed methodology is applied to the case study of the UNESCO World Heritage site of the Amalfi Coast in Southern Italy too. The results show that regulation and maintenance services, as well as provisioning services, are priorities for the conservation of terraced landscapes. The terraced landscapes represent a particular type of agricultural landscapes, which are considered at risk due to economic and social transformations. Several international initiatives (UNESCO, ITLA, FAO GIAHS) highlight the need to assess, evaluate, protect and valorise the complex system of services and benefits provided by terraced landscape, in order to avoid the irreversible loss of cultural landscapes that provide an effective model of resilience built over centuries.

The paper of Bice Cavallo, Livia D'Apuzzo, Luciano Basile investigates conditions, weaker than consistency, that a pairwise comparison matrix has to satisfy in order to ensure that priority vectors proposed in literature are ordinal evaluation vectors for the actual ranking. In particular, the authors introduce a partial order on the rows of a pairwise comparison matrix; if it is a simple order, then the matrix is transitive, the actual ranking is easily established and priority vectors are ordinal evaluation vectors for the actual ranking.

Paola Carone investigates sustainable development potentialities of the ports of Tangier. Ports have always been places of the liveliness and dynamism of the cultural, economic and social development of cities, metropolitan areas and regions. The life of port areas is characterized by the flows of goods, people, languages, cultures that contribute in a way that seems intangible, but is a determining one actually, to the design of the urban context. Thinking about the potentialities of port cities in contexts related to the South of the World could be a further strategy in order to propose scenarios for really sustainable development of developing countries. The port area of Tangier in Morocco, currently characterized by two poles, the historical old port in the city center and the new one at 40 miles from the previous Tangier Med, could be an interesting laboratory for reasoning and proposing innovative strategies and plans to achieve local and global sustainable development.

The paper of Hella Ben Brahim Neji and Adel Besrouer analyze students' perceptions of innovation in sustainable development technologies and their role to optimise higher education's quality. Technological innovation and scientific research have always helped industry and other economic sectors to evolve, allowing them to reduce their production, operation and maintenance costs, and in return, the fields of engineering and innovation widened increasingly. The objective of this research is to evaluate the importance technological innovations in sustainable development (especially, green energy) on the quality of higher education improvement. The study is based on a survey conducted among a sample of students from the High School of Technology and Computer Sciences (ESTI – University of Carthage, Tunisia), pointing out the need to integrate teaching staff, researcher and students, in identifying and optimization technological solutions.

Stewart Bailey, Advait Deshpande, and Alby Miller introduce the use of 3D visualisation for urban development, regeneration and smart city demonstration projects, considering the examples of Bath, Buckinghamshire, and Milton Keynes. The paper discusses three different case studies related to the use of 3D visualisation for projects focussing on urban development, regeneration, and Smart City demonstrations. With each of the case studies,

the problem statement, the approach adopted for 3D visualisation, and the outcome is covered. The paper concludes by discussing what 3D visualisation offered to each project. The paper discusses how in order to effectively use 3D visualisation the approach needs to be adapted according to the problem statement. Depending on the project requirement, 3D visualisation is likely to serve multiple purposes in urban development, regeneration, and Smart City demonstration projects. The paper suggests that the use of 3D visualisation adds an extra dimension to presenting data and also provides an effective tool for analysing the data.

