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Sondaggi/Surveys

Exploring Urban Resilience

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Preserving biodiversity is possible only if it is taken as the logic of production: uniformity as a model is necessary only in the context of the control and profit.

Vandana Shiva

Monocultures of the mind, 1993

In 1798, the economist Thomas Malthus¹ published '*An essay of the principle of the population as it Affects the Future Improvement of Society*' in which he deepened the theme of the relationship between the food needs and the population growth in the territory. He outlined the theory according to which, the population of a country grows for geometric progressions (quickly), while the availability of food increases by arithmetic increments (slowly), with the result that the settled communities should keep less and less fertile land, to obtain just a few livelihoods, to the inexorable stop of the economic development. On this theory the American philosopher Waldo Emerson said that «*Malthus forgot that the human mind is also a factor of political economy and the growing needs of the society will be met through the technological innovation*». At a distance of a couple of centuries, with the introduction of the so-called "*green revolution*", ideologically driven by Norman Borlaug², and the genetic engineering applied to agriculture, perhaps the thesis of Waldo can be more persuasive, considered that annually the food production has increased tenfold allowing to the world's population to reach levels of growth unthinkable until then. (image 1)

But if in the past, the innovation has been the key to success for businesses and dynamic territories, today it has become an important part of the demand for change fostered by the challenge imposed by the crisis, in its economic complexity (increase in public debt), environmental (anthropogenic pressure) and social (reduction of human development indices). We attend, in other words, to a progressive evolution of the concept of innovation. Starting from a linear approach, substantially based on the incremental development of functions, we are switching to a more systemic vision able to incorporate multiple contexts, even those more fragile (as proximity agriculture or informal settlements) defined by an increasingly interdependent and globalized world.

¹ Thomas Robert Malthus (Roocherry, 1766 - Bath, 1834) was a well-known English economist and demographer, that starting from the study of the New England colonies reasoned on the risks of an exponential growth of the population, due to the "unlimited" availability of new fertile lands. His theories inspired the future Malthusianism movement, which refers to birth control as a means to prevent the impoverishment of humanity. Malthus also published '*Investigation of the causes of the present high price of commodities*' (1800) and '*Essay on income*' (1815), in which he formulated the theory of differential income.

² Norman Ernest Borlaug (Cresco, 1914 - Dallas, 2009) was a famous American agronomist and environmentalist, father of the '*green revolution*', in 1970 he gained the recognition of the Nobel Prize for Peace for his efforts in the fight against hunger in the World. Although the '*green revolution*' has helped to satisfy the growing global demand for food, especially in developing countries, it provoked radicals critics, underlining the limits on the environment (reduction of biodiversity due to monoculture, soil pollution, depletion and soil erosion, excessive consumption of water resources), on the social (the disintegration of rural communities and of local products) and on the health (spread of harmful chemicals).

If the rapid change of land use is significantly influencing the dichotomous relationship between the rural and the urban matrices; how can spatial planning face the risks of the progressive homologation of these contexts? How it can prevent the erosion of the ecosystem services³ connected these realities? How it can limit the reduction in term of resilience and adaptability capacity compared with the ecological stress?

The term *resilience*, associated with the urban planning disciplines and territorial governance, has gained increasing importance in the last decade, with reference to the issues of sustainable development, the prevention of environmental risks, as well as the adaptive capacity of the territories. This concept mainly covers two distinct semantic areas that refer both to the idea of stability: the first concerns the sphere of technical sciences and physics (*engineering resilience*), describing the properties of materials withstand impulsive force and regain the original form after an elastic deformation; while the second approach refers to environmental, biological and ecological sciences (*ecosystem resilience*), dealing with the ability of a complex system, natural or man-made, to restore the homeostasis after an external intervention, or the erosion of its productivity.

In both cases resilience doesn't imply the return to an initial state, but rather an evolution towards more resistant forms in a new balance between losses and gains. The redundancy (quantitative and qualitative) of the characterizing elements of a system, such as the biodiversity of the living species, the overlap of functions, the regenerative capacity of the territory, are among the main factors that make the *resilience* a fundamental concept for the advancement also of the increasing level of urban studies' complexity. (image 2)

In addition to this, agriculture can be a significant area of investigation on which to apply the concept of resilience, starting from the soil fertility, to the crop rotation, towards the economical model adopted and the organization of the small and medium companies; from the diffusion of intensive production imposed by agro-industries, to ecological and cultural values of the smaller self-organized forms of cultivation practices in urban areas.

In this sense, the proximity agriculture assume a role of one of the possible themes of the project to rethink the values related to urban open space, in relation to the existing green systems that today the city preserve. The principle of multi-functionality, applied to urban landscapes, can become, therefore, a tactic to respond to the specific challenges of contemporary society, in relation to the quality of living, deployment of services, ecological sustainability (including the self-production that is a significant factor).

If today, talking about sustainability about urban design requires a deeper knowledge of the idea of regeneration, with a capacity to produce new interactions between the various contexts, it's perhaps within the periurban realities, the abandoned or vacant plots or in the urban voids that are evident the greatest potential to catalyze ecological resources and local identities. (image 3)

In the contemporary urban areas the role of the voids has become significant, for the extension of the city, for the discontinuity of its "parts", for the life cycles of its structures and landscapes. Inside and outside the city we can recognize the *"architecture of the void"*, even their incomplete variations. In 1960 Kevin Lynch in *'The Image of City'*, referring to studies of Ian Mac Harg⁴ and Max Falque on social sciences, humanities and territory, claimed how the public spaces and urban void can contribute to the formation of a common mental image of the city⁵: a connotative reference system for all the urban space.

People commonly recognize the roads or other infrastructure for their development, squares for their homogeneous connotation, parks for their extension, it's possible to find a series of empty spaces that are really hard to recognize normally. Some of these show the character of sort of *"natural places"* (going back to the common idea of public green zones), while for others, it's necessary to use unconventional interpretative logics: it's possible to evaluate the generic extensions through the study of the edges, perhaps it's possible to identify the functional or temporary uses associated with them, but it's however difficult to bring them back to some characterizing formal categories. Bernardo Secchi defines them as «... *spaces that are between things, between subjects and objects next to each other, become empty because they lack a recognizable role*».

³ Ecosystem services, as defined by the *Millennium Ecosystem Assessment* (2005) are configured as «*the multiple benefits provided by ecosystems to human beings*». The document describes four main categories: life support (such as nutrient life cycle, soil formation and primary production), procurement (such as the production of food, drinking water, raw materials or fuel), regulation (such as climate control and tidal waves, water purification, pollination and natural prevention of infestations), cultural values (including the aesthetic, spiritual, educational and recreational).

⁴ Ian L. McHarg (Clydebank, 1920 - Chester, 2001) architect and landscape designer of Scottish descent, he focused his academic work in the United States, founding the Department of Landscape Architecture at the University of Pennsylvania. Known primarily as an essayist, his studies have included the relationship between regional planning and natural ecosystems, contributing not only to the advancement of the bio-regionalist approach, but also laying the groundwork for the development of modern Geographic Information Systems (GIS).

⁵ Kevin Andrew Lynch (Chicago, 1918 - Martha 's Vineyard, 1984) after the experience at Taliesin under the guidance of Frank Lloyd Wright, is formed as an urban planner and professor at MIT in Boston, concentrating his studies on the geography of perception and environmental psychology. The most famous book *'The Image of City'* is the result of an investigation into the way in which the visitors of the city interpret urban space organizing it, according to a common patterns of thought scheme, through five specific categories: paths, edges, districts, nodes, references.

If the landscape design approach project is based also on the critics to urbanization, it's interesting to note how the different contemporary lecture on cities draw new relationship with the production's spaces without considering the local actors (farmers for example) that should characterize them. (image 4)

But the citizens of the XXI century will increasingly need natures to live and to perceive, redefined according to the different cultures, whether they resulted in the elective forms of *gardens and parks*, or the more informal and spontaneous examples, as *urban agriculture*⁶ in a position to be able to reinterpret those residual spaces between things, incomplete and generic. In this sense, the agricultural fringe spaces, as well as the urban one, can be understood as distinctive elements to "*make landscape*", because starting from their first production meaning (*self-sufficiency*), then responding to the citizens' need to claim green spaces where recognize themselves (*self-identity*).

The interest on the landscape of urban *left overs* produced by sprawl and their reclamation is a phenomenon already common in urban design's approach in Europe as emerged from several studies on the integration of agricultural areas within the urban fabric and the specific initiatives at Community level. Some *Interreg* actions, or programs like *Metropole nature*, *Extramet*, *PURPLE (Peri-Urban Regions Platform Europe)* or *PLUREL (Peri-urban Land Use Relationships)*, contribute to the discussion on these issues, especially when made in relation to the evolutionary dynamics of the territory. Urban regeneration, trough the "*bottom up*" redevelopment of these residual spaces, can take on a new procedural vision balanced between collective interests and forms of environmental compensation.

The nature of productive landscapes related to the urban voids is intertwined, therefore, with that of the project for green infrastructure at the local level: one of the great *leitmotif* of European political agendas as well as within the *Common Agricultural Policy (CAP)*⁷.

This outlines an attitude to consider the landscape as a sequence of "*waiting vacant areas*", with different development pattern and with possibilities of more or less durable interventions. From urban ephemeral to territorial ephemeral, in a sort of "*temporary landscape*" yet to be investigated and to develop, as an architecture of complex relationships and not only of relationships between the volumes.

So it makes sense to talk about new concepts of conservation, in favor of policies that are not restricted to ensure the passive protection of landscapes, ineffective and often counterproductive, but that will ensure the continuous transformation with appropriate management and creative interventions that are necessary in situations of degradation, problems, or profound alteration.

References

- BAKKER N., DUBBELING M., GÜNDEL S., KOSCHELLA U. (2000) *Growing Cities, Growing Food: urban agriculture in the policy agenda*, Deutsche Stiftung für internationale Entwicklung: Feldafing
- BETTINI V. (2004) *Ecologia urbana. L'uomo e la città*, UTET Libreria: Torino
- COLDING J. (2007) *Ecological Land-use complementation for building resilience in Urban Ecosystems*, in *Landscape and Urban Planning*, vol. 81, pp. 46-55.
- COYLE S. (2011) *Sustainable and resilient communities: a comprehensive action plan for towns, cities and regions*, John Wiley & Sons: Hoboken
- DONADIEU P. (2004) *La construction de la ville campagne. Vers la production d'un bien commun agriurbain*, Colloqui: Torino
- DONADIEU P. (2006) *Campagne urbaine. Una nuova proposta di paesaggio della città*, ed. italiana (a cura di) M. V. Mininni, Donzelli: Roma
- ESPUELAS F. (2004) *Il vuoto: riflessioni sullo spazio in architettura*, Marinotti Edizioni: Milano
- FABBRI P. (2007) *Principi ecologici per la progettazione del paesaggio*, Franco Angeli: Milano
- FLEURY A., DONADIEU P. (2003) *De l'agriculture péri-urbaine à l'agriculture urbaine*, *Courrier de l'environnement de l'INRA*, vol. 31, pp. 45-61
- GORGOLEWSKI M., KOMISAR J., NASR J. (2011) *Carrot City: creating places for urban agriculture*, Monacelli Press: New York
- GUNDERSON L., HOLLING C.S., LANCE H. (2002) *Resilience and Adaptive Cycles*, in Gunderson L., Holling C.S. (a cura di) *Panarchy: understanding transformations in human and natural systems*, Island Press, Washington, D.C.
- HERBERT G. (2010) *Cities, People, Planet: liveable cities for a sustainable world*, John Wiley & Sons: Hoboken
- J. NASR (2005) *L'émergence des réseaux d'agriculture urbaine hors de l'Europe*, in A. Fleury (a cura di) *la Multifonctionnalité de l'agriculture périurbaine: vers une agriculture du projet urbain*, Cahiers de la multifonctionnalité
- LYNCH K. (1990) *Progettare la città*, Etas: Milano
- MCHARG I. (1995) *Design with Nature*, Sustainable Design book n.6, John Wiley & Sons: Hoboken

⁶ Several international experts such as Joe Nasr, Andre Viljoen, Katrin Bohn and Donadieu Pierre, just to name the most relevant, commonly agree on the definition of urban agriculture as «... a practice for cultivating, processing and distributing food in urban or peri-urban areas, which is characterized through actions of horticulture (Urban farming) or hybrid forms of gardening (Community gardens), following the principles of organic farming, breeding, aquaculture and beekeeping». For a more extensive definition of Urban and Periurban Agriculture see Nasr J., Komisar J., Gorgolewski M. (2009) *Designing for Food and Agriculture: Recent Explorations at Ryerson University*, Open House International, Toronto; Nasr J. (2006) *L'émergence des réseaux d'agriculture urbaine hors de l'Europe, la Multifonctionnalité de l'agriculture périurbaine: vers une agriculture du projet urbain* (ed.) Fleury A., Cahiers de la multifonctionnalité

⁷ The *Common Agricultural Policy (CAP)* is one of the Community action of greater importance, which employs about 34% of the EU budget. There are several research programs that starting from the strategies of Agenda 21 (*Interreg*, *Leader* and *Leader plus*) are working on the issue of government land and in the communities of European peri-urban region. For more information, see the web pages of the programs PLUREL (<http://www.plurel.net>) PURPLE (<http://www.purple-eu.org/>)

MORGAN K., SONNINO R. (2010) *The Urban Foodscape: World cities and the new Food Equation*, Cambridge Journal of Regions Economy and Society, vol. 24, pp. 72–84.

MOSTAFAVI M., DOHERTY G. (2010) *Ecological Urbanism*, Lars Muller: Baden

MOUGEOT L.J.A. (2005) *Agropolis. The Social, Political and Environmental dimensions of Urban Agriculture*. Earthscan & Idrc: London-Ottawa

ODUM E. P. (1963) *Ecologia*, Zanichelli: Roma

PETRILLO A., PROSPERI D. (2011) Metaphors from the resilience literature: guidance for planners, in Proceedings of REAL CORP 2011, pp. 601-611

PICKETT S., CADENASSO M., GROVE M. (2004) *Resilient Cities: meaning, models, and metaphor for integrating the ecological, socio-economic and planning realms*, in *Landscape and Urban Planning*, vol. 69, pp. 369–384

RICCI M. (2012) *New Paradigms*, Actar-List: Barcellona

SANTOLINI R. (2011) *Servizi ecosistemici e sostenibilità*, in *Ecoscienza*, vol. 3, pp 20-23

SECCHI B. (1993) *Un'urbanistica di spazi aperti*, in *Casabella*, n° 597-598, p. 5.

SMIT J., NASR J., RATTA A. (2001) *Urban Agriculture: Food, Jobs and Sustainable Cities*, United Nations Development Programme, The Urban Agriculture Network.Inc, New York

SMITHSON A. e P. (1976) *La qualità dell'ambiente*, in *Spazio e Società*, n. 1

STEEL C. (2009) *Hungry City. How food shapes our lives*. Random House: London

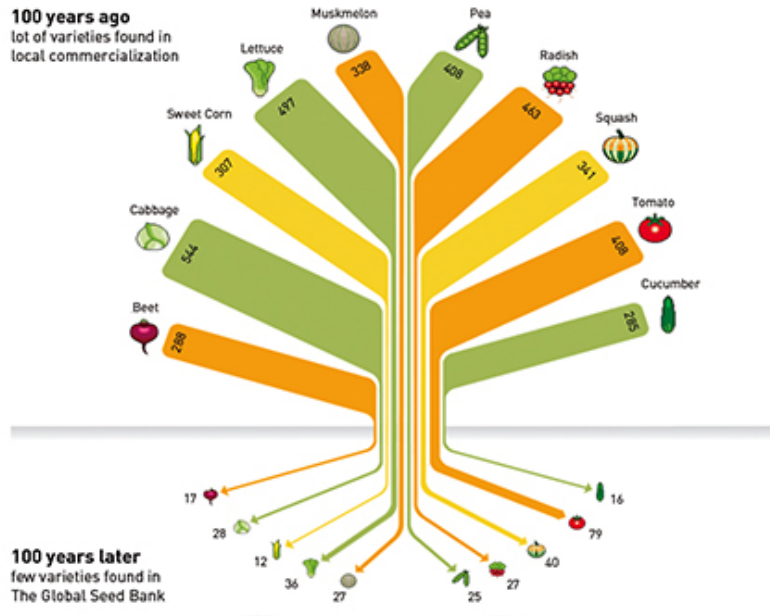
VAN DER SANDE B. (2012) *Food for the City: A Future for the Metropolis*, Nai010 publishers: Rotterdam

VILJOEN A., BOHN K., HOWE J. (2005) *Continuous Productive Urban Landscapes: designing Urban Agriculture for sustainable cities*, Architectural Press: Oxford

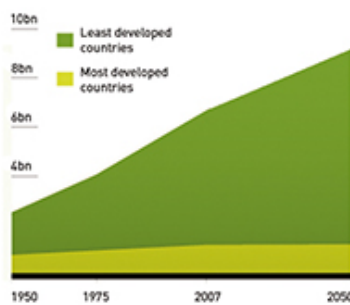
WALDHEIM C. (2006) *The Landscape Urbanism Reader*, Princeton Architectural Press: New York

WHITE M., PRZYBYLSKI M. (2010) *Bracket, architecture, environment: on Farming*, Actar: Barcellona

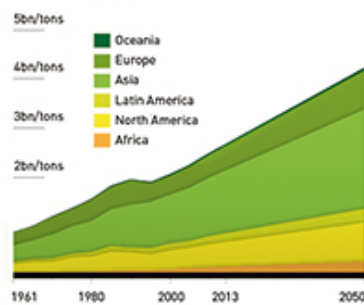
Loss in Biodiversity after Green Revolution fonte: FAOSTAT



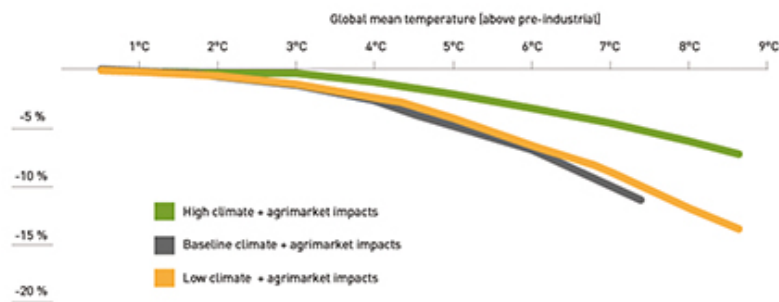
World population source: UN DESA



Cereal crop production source: FAOSTAT

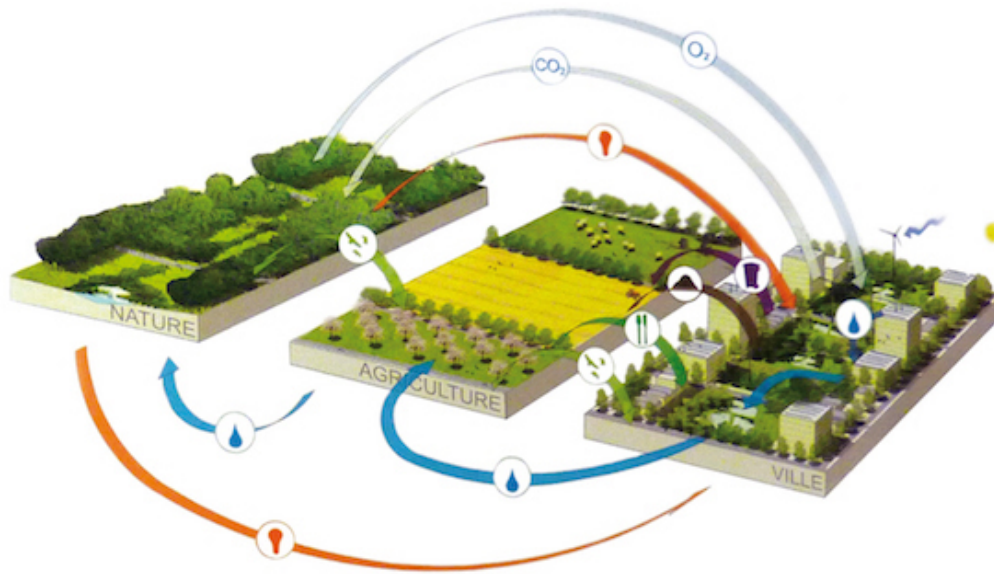


Mean Losses in per capita GDP from Climate Change source: FAOSTAT



1 - The increase productivity in agriculture sector led to a progressive loss of crops' biodiversity.

Environmental impact and difference between conventional or resilient community source: COYLE S. [2011]



	Conventional high carbon Community	Resilient low carbon Environment
Urbanisation or development pattern	Dispersed uncontained growth in the countryside; Fuel and raw materials dependency; Lacking of clearly ecological pattern in the city.	Compact and bounded for small community; Green corridors and ecological oriented for big community.
Land-use pattern	Use-based zoning both in urban and rural territory; No control over the forms and urbanization trends; High density housing, commercial sprawl, infrastructure pervasively growth, waste and vacancy increase.	Flexile zoning reuse, enhancing urban mixité
Public space forms	Fragments or enclosures agricultural plots; Public spaces scaled on the automotive; Parks and green areas scaled to adjoining infrastructures.	Human centered design; Multifunctional services in periurban green spaces; Ecosystem services.
Transports and mobility	Use of motor vehicles	Public transport with no or low carbon fuels or vehicles demand-management technologies; Pedestrian cycling network.
Energy production	Conventional energy fossil fuel-generated	Renewable and limited fossil fuel-generated electric power, improve efficiency and demand's reduction.
Water resources	Conventional water supply system delivered via engineered hydrologic or hydraulic components; Run off drainage based on conventional watershed.	Reduce water demand, increasing performance of natural watershed cycles or at urban scale, storm water recycle for compatible uses.
Food and agriculture	Conventional food supply consists largely of monocultures related to rice, grain, mais production (on petroleum and fertilizer based technologies).	Sustainable agriculture and food short chains; Improvement of local regional supply food biodiversity; Education on quality food oriented diet.
Solid waste	A minimal waste recycling or reduction; Land filling and other high impact waste treatment.	Sustainable solid waste system, recycling, zero waste approach (recycling in use and packaging).
Economic	Economic system focuses on prosperity by increasing production and consumption of good and services.	Increase the community prosperity through production, distribution of goods and services due to necessity or reducing waste and energy losses.

2. Comparison between the current urban model and the ecosystem resilience's integrated one.



3. The access to methods of direct cultivation or km0 brand, together with purchasing of the DOP, DOC, IGP products generates a future scenario also in periurban contexts and promoting the commercialization on a local scale.



4. Starting from the 50's, in the south-east part of Berlin have been set up large areas of kleingärtens, which became a real open spaces' essential and distinctive elements for landscaping, production or simple hobbies.



5. Land-use matrix of the Kleingartenverein system in Berlin Britz's outskirts.

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