

# Designing Resilience

edited by

Maria Teresa Lucarelli

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Piet Mondrian, *The Gray Tree*, 1911

**Book series STUDI E PROGETTI**



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# INDEX

<b>Preface</b>	
<i>Mario Losasso</i>	11
<b>Designing resilience and participation: a desirable synergy</b>	
<i>Maria Teresa Lucarelli</i>	13
<b>Participatory design to assist scientific research</b>	
<i>Andrea Pillon</i>	17
<b>A new, young “investigative community” within the discipline of Architectural Technology</b>	
<i>Laura Daglio</i>	23
<b>1 Research Cluster on resilience</b>	31
1.1 Adaptation vs fragility, rule vs exception: antinomies of the architectural heritage - <i>Maria Luisa Germanà, Vincenzo Paolo Bagnato</i>	33
1.2 Accessibility, between technology and social background <i>Christina Conti, Valeria Tatano</i>	39
1.3 The energy dimension in the design for building and urban resilience <i>Fabrizio Tucci, Carol Monticelli</i>	47
1.4 Resilience and technological innovation: new trends in research <i>Ernesto Antonini, Francesca Giglio, Massimo Rossetti</i>	57
1.5 Resilient practices for a new culture of environmental design <i>Oscar Eugenio Bellini, Marina Rigillo</i>	65
1.6 Regeneration and resilience: strategies to close the loop for the future of the built environment <i>Maria Rita Pinto, Cinzia Talamo, Serena Viola, Giancarlo Paganin</i>	75
1.7 Social, economic and environmental sustainability in planning community services <i>Tiziana Ferrante, Andrea Tartaglia, Maddalena Coccagna</i>	87
1.8 Design for living: strategy and tactics to face changes <i>Massimo Perriccioli, Elisabetta Ginelli</i>	95
<b>2 Contributions from an “investigating community”</b>	103
2.1 Principles of resilience in the Technological design culture <i>Donatella Radogna, Salvatore Viscuso</i>	105

2.1.1	The sense of the words - <i>Maria Canepa, Chiara Piccardo</i>	112
2.1.2	Resilience and sustainability <i>Anna Cantini, Carlotta Mazzola, Manuela Romano</i>	119
2.1.3	Performance-based approach and upgrade of the categories of demand <i>Simona Casciaro, Cristina Fiore, Daniele Iori, Ilaria Montella</i>	127
2.1.4	Regeneration and prevention in the system approach <i>Lia Marchi, Roberto Pennacchio, Francesca Thiébat</i>	142
	References	152
2.2	Design and strategies for the resilient project <i>Antonella Violano, Gianluca Pozzi</i>	161
2.2.1	Resilience monitoring at the urban and territorial scale <i>Silvia Cesari, Sara Codarin, Sara Ganassali</i>	171
2.2.2	Beyond the control of building life cycle. From product to building system - <i>Marta Calzolari, Anna Dalla Valle, Valentina Frighi, Caterina C. Musarella</i>	179
2.2.3	Incentive instruments and tools <i>Serena Giorgi, Giovanna Maria La Face, Giuseppina Vespa</i>	192
2.2.4	Technological transfer - <i>Davide Cerati, Margherita Ferrari</i>	199
2.2.5	Training: soft-technology for design <i>Lorenzo Savio, Santa Spanò, Silvia Tedesco</i>	205
	References	215
2.3	Data, information, knowledge for the design <i>Stefano Bellintani, Valeria Cecafofso</i>	225
2.3.1	Tools and data in the interconnected city for an enhanced planning - <i>Alberto Celani, Viola Fabi, Anastasiia Sedova</i>	237
2.3.2	Widespread information and tools for the design and management of the built environment <i>Nazly Atta, Alessia Spirito, Flavia Trebicka</i>	248
	References	259
2.4	Networks of consciousness - <i>Maria Antonia Barucco, Laura Calcagnini</i>	265
2.4.1	The network for the project of prevention and ex-post dynamics - <i>Francesca Paoloni, Rossella Roversi</i>	271
2.4.2	The network as a tool for dialogue and the construction of new knowledge - <i>Daniele Boni, Alessia Caruso</i>	277
	References	283
2.5	The link between resilience and participation. Perspectives of technological research - <i>Filippo Angelucci, Mattia Federico Leone</i>	285
2.5.1	The quality of the project beyond standards <i>Valentina De Paolis, Jenine Principe</i>	293



2.5.2	New approaches for the management of common goods in urban environments <i>Chiara Agosti, Martina Bosone, Giovanni Castaldo</i>	300
2.5.3	The new professionals training in participatory processes and the role of technological culture in the urban project <i>Martina Block, Gianluca Danzi, Carmen Rauccio</i>	309
2.5.4	Principles and subjects for a participative environmental design - <i>Federica Dell'Acqua, Gianpiero Venturini</i>	318
	References	325

**Prospects for a “resilient” research**

*Elena Mussinelli*

331

## 2.5.2 NEW APPROACHES FOR THE MANAGEMENT OF COMMON GOODS IN URBAN ENVIRONMENTS

Chiara Agosti\*, Martina Bosone\*\*, Giovanni Castaldo\*\*\*

### *Common goods in urban settlement: regenerating spaces to regenerate values*

The increasing interest of the citizens towards forms of participatory governance for the management of the so-called “common goods” (Mattei, 2011), has been recently implemented in experiences of active participation of the communities. The actions carried out by citizens, often organized in associations, testify a new necessary impulse to stimulate their pro-active role as actors in the decision processes (Bollier, 2015).

These practices stimulate a sense of solidarity and encourage the active citizenship, responsible and supportive in the participatory management of the common goods (Ostrom, 2009), feeding in the community a sense of belonging to the place, a new conscience, a sort of sense of responsibility towards the urban common goods.

These experiences shape a so wide and rich framework of case studies to induce to question on the reasons that determine this tendency in action. They express a reaction to the recent economic crisis, which appears to be the crisis of a cultural model rather than of the economic one.

The need of re-appropriation of commons expresses the necessity to fill the cultural void that has progressively estranged the people from their places. The physical re-appropriation through actions of “care” based on collaboration and sharing, has a broader value: it expresses the intention to rebuild a sense of identity and affiliation of a community to the place, and the wish to reconstruct the sense of identity and belonging which allows a group of people to define themselves as a “community”. In the interaction between physical and social system, it is necessary to recompose a balance among the ability to innovate and create new values and the need to preserve specific identities, according to an evolutionary continuity. The concept of common goods is uncertain, fluid,

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fleeing, polysemic. The term common good is often used with reference to goods that must be accessible to every person in the community of whose they are affiliated. The Rodotà Committee has defined more specifically them in 2007 as goods that *«express a functional utility to the exercise of the fundamental rights and the free development of the person»* (Commissione Rodotà, 2007).

The definition that today is generally shared is that of goods that, being functional to the free development of the personality, must be accessible to everybody, independently from the ability of each individual to contribute to the costs sustained for their production. So understood, and according to the economic definition, common goods are often rivals (because the use by someone subtracts the availability of the resource for the use by the others), but socially not excludible (it is not possible to prevent someone to access the use of the resource).

Therefore, they can be defined as

*«the natural resources, but also the artificial ones (as the historical-cultural patrimony) or the physical infra-structures (aqueducts, roads and communication networks), the IT resources (internet or other networks), the immaterial ones (the knowledge and the system of relationships and communication through which it circulates), under the condition that they are qualified from a certain formality of governance and management»* (Sacconi and Ottone, 2015).

In this way a relationship is established among the resource, who guards it and who contributes to its maintenance, reproduction, development, and the consumers. Such relationship strongly ties the common to the community of reference and to the territorial area in which it is available.

The kind of governance becomes therefore a remarkable element to determine, through a collective choice, the use of a resource as common good, using it in shared way and with open access. In this sense, the role of the public administration becomes larger, training and favouring the initiatives and the collaboration between the private sector and the social operators, particularly the cooperatives.

The emergent character of the practices, tied up to the concept of common goods, opens up a new road to the territorial and social planning: putting in a network public subjects, private actors and citizens can trigger micro-interventions that have the potentiality to regenerate the territory, not only including the physical sphere but also the social one, renewing the sense of identity and belonging, the cohesion and the organizational ability of a given community (CSIRO, 2007).

The recent experiences of active citizenship and the attempt of confrontation and coordination conducted by administrators, citizens, economic, social and cultural actors in regenerating the social capital of the involved communities, have also determined an increase in the actions of care of the built environment, effectively impacting on the improvement of the levels of “integrated” quality of the urban systems (ecological, social and economic).

It is therefore necessary to understand, on the base of a systemic approach, in which way the urban systems respond to the solicitations of endogenous processes and/or of external factors, appraising the potential impacts at multidimensional level. Such approach, by considering the urban systems as complex adaptive system, allows to gather the complexity and the interactions among the different elements of the urban system and in comparison to every disturbing factor, at different scales and over time.

With respect to this, the concept of resilience can play a key role with the purpose of increasing the ability of the social and territorial systems to face, to adapt or to change in response to heterogeneous pressure factors. In fact, the recent “evolutionary” interpretation of resilience connects this concept to the “adaptive” abilities of the complex systems, able to learn from the experience, to elaborate the information and to suit for the changes (Holling, 1973; Walker et al., 2004, Folke et al., 2010). According to the definition by Walker, three aspects govern the dynamics of the socio-ecological complex systems: resilience/reactivity, adaptability and transformability<sup>1</sup>. Such criteria allow to elaborate an effective answer to the actual situation of instability of the environmental, social and economic systems, representing fundamental elements of a planning strategy aimed to the maintenance and the exploitation of the ecological-environmental reactivity, of the organizational-procedural adaptability and of the technological-spatial transformability of the whole settlement system.

The multiplicity of suggestions and problems involved in participated processes and the multi-dimensionality of the impacts that derive from them, underline the necessity to look at the built environment in its totality, overcoming the conception of interventions limited in time and space, and focusing instead on the inter-systemic and inter-scale nature of the settlement systems (Angelucci et al., 2013).

Participation and resilience are therefore tightly tied up, since the construction of an active citizenship contributes to the increase of the resiliency of the cities in its various dimensions, improving the adaptation ability of the consumers, the level of transformability of the system and the reactivity of the bio-ecological components.

Therefore, the participated processes can be interpreted as real “practices of resilience”: the overcoming of the particularism and the cohesion of the local community on recognized values of general interest, and whose basis to direct the actions to undertake on the goods, increases the resilience of a determined

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<sup>1</sup> According to the definition of Brian Walker on “resilience of the socio-ecological complex systems”: i) the resilience or reactivity is the ability of a system to absorb the effects of trouble and to reorganize itself through a change, maintaining its same functions, the structure, the identity and the retroactions; ii) the adaptability is the ability of the actors of the system to influence and to govern the change; iii) the transformability is the ability to produce new systems/sub-systems, when the ecological, economic and socio-politics conditions make inadequate the existing system.

process, preserving its specificity tied up to the context and guaranteeing its response capacity to disturbing factors.

In this view, the participation becomes the first necessary step not only to increase the resilience of a community connected to a determined asset, but also the resilience of the good itself, being it a single building or an urban area. The resilience does not assume the characteristics of a pure and simple ability to withstand, but it represents a way to absorb the traumatic experience and to translate it in a positive way to shape new states of equilibrium, incorporating the ability to adapt to changes linked to stress/discomfort conditions.

The need to translate the resilience from a theoretical practice to a concrete urban management action, implies the rethinking of the concept of development, which is not aimed to preserve a given stability, but to always build a new one (Fabbricatti, 2013). A model of territory able to change and to answer to perturbations responds to this demand by creating continuous dynamic processes of learning and interaction. The way in which communities are organized represents a real opportunity for learning and innovating the organizational routines.

The process (and project) of resilience assumes therefore the characteristics of a space for social learning, in which collective competence (community capability) can be developed through a cooperative approach, starting from the pre-existing individual abilities. Participation becomes a critical knowledge and awareness process that brings to the construction and the sharing of values and objectives for the general interest.

### *Towards a new model of intervention on common goods*

According to the previous considerations, the central issue for the affirmation and consolidation of active citizenship practices with a view to resilience consists of updating the relational patterns between urban actors. Indeed, the affirmation of the new role of the local communities requires a reorganization of the consolidated ways of interaction between decision makers, stakeholders, users and designers. This scenario is particularly evident in the current phase, where in many urban contexts - with specific conditions of economic crisis and urban transformation deadlock - the need to seek new forms of project activation through a renewal of governance models is particularly evident (Iaione, 2015).

The notions of complexity-based governance framework and transition management (Loorbach, 2010) are in this sense relevant for the definition of flexible and multi-level networks in order to overcome situations of crisis, seeking alternative tools for achieving a new stability condition. This conceptualization incorporates the “adaptation” dimension of the complex city-system to new social, economic and cultural paradigms, in a temporal and procedural dimension (Drift, 2014). Processes based on a renewed relationship between mu-

municipalities, investors and citizens - according to many and varied schemes - toward the notion of “collaborative governance” in a horizontal and participatory logic:

*«with reference to urban centres, we mean the production of new and stronger relations between citizens, public administration, private individuals and the third sector. Some examples are the regulatory frameworks of common goods, the involvement of citizens in defining new needs in order to find out new tools to satisfy them»* (Unipolis, 2015).

Another element related to the progressive updating of the governance models relies on the parallel revision of the partnership and cooperation tools, aimed at the convergence of widespread interests and the finding of resources, including the economic ones, for the financing of projects. In this sense, the sharing or collaborative economy (Unipolis, 2015) also includes the purpose of supporting bottom-up actions and participatory processes. At the same time, new instruments of public-private partnership and models of cooperation and social development are today an increasingly important background: civic crowd-funding initiatives on the one hand - the so-called fourth generation of this instrument - and new partnership models on the other hand - with projects aimed at generating measurable social effects, as well as more efficient public spending in the pay-for-success logic (Pasi, 2015) - represent instruments with growing potential.

This evolution of practices, tools and models is supported by regulatory updates<sup>2</sup>, in the perspective of defining codified procedural frameworks. With particular reference to the field of common goods, many cases of specific municipal regulations are being introduced, starting from the experience of the Municipality of Bologna in 2014, and the so-called “cooperation agreements” between municipalities and groups of active citizens<sup>3</sup>. The regulatory updates also extend to the fields of the consultation, the community initiative, the activation of participatory budgets and participation tables: instruments based on the common recognition of a new role of the citizenship. The recent reform of the Procurement Code (Legislative Decree N. 50/2016) also gives new elements in this sense, in particular with the introduction of the institution of the “public

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<sup>2</sup> For an in-depth analysis of the evolution of the notion of participation as well as of the tools and rules, see: Schiaffonati, F. (2008) “Le origini del progetto partecipato”, in Vitrano, R.M., (2008), *Architettura strategica. Tecnologie e strategie del progetto partecipato*, Luciano, Napoli, pp. 43-58.

<sup>3</sup> There are many tools of representative democracy, regarding both the field of the common goods and other forms of participation and collaboration. In a synthetic and not exhaustive way, among the consolidated and ruled forms, we may list: voluntary agreements, cooperation tables, memorandums of understanding, conferences, health agreements, zone plans. Voluntary tools include: 21 local agendas, participatory urban planning laboratories, participatory budgets, corporate social responsibility, tables between businesses companies and local communities (Manconi, 2015).

debate”<sup>4</sup> aimed at overcoming the only consultative dimension of the participation (Schiaffonati, 2008; Pillon, 2016).

Despite these regulatory updates and the establishment of new ways of interacting between institutions and organized groups of citizens, the issue of participation and actions on common goods sets a highly heterogeneous scenario of typologies, dimensions, characteristics and outcomes. The management and the control of these experiences appear difficult, with diversified project results. Many questions arise, both at an operational and at a theoretical-cultural level. Participation practices are also characterized by a high degree of spontaneity, based on the principle of claiming a new actor, with multiple cultural references such as, among others, the “tactical urbanism” of Lydon-Garcia, the tactical role of the communities evoked by De Certau, the claims on the “right to the city” by Lefebvre. This further increases the degree of randomness and the variety of experiences, linking the activation of projects to the capacities of certain local realities. From this perspective, the risks of self-reference, exclusion, pre-eminence of some needs over others must be considered, undermining the possibility of raising the level of resilience of a context in the face of a weakening of the cohesion.

In order to cope with the general level of complexity of this phenomenon, it is increasingly central to consider such practices in a systemic perspective, considering the whole process, from the strategic-programmatic level to the operational-planning and implementation level. In fact, the weaknesses of these processes can be traced back to the lack of decisional and managerial clarity, to a high segmentation of skills and actions, to a lack of full consideration of the constraints framework, to an absence of control and evaluation of the achieved results in relation to the pre-established objectives.

With reference to these aspects, a reference to the role that the technological-environmental approach to the project could cover is needed, also with reference to the project management and to the link between the different dimensions of the project, therefore both the immaterial and the material ones. The reference is to the building process control techniques, to the definition of the meta-design framework, to the development of the detailed design phases, to the framing of the initiative in the system of regulatory, procedural and economic constraints - and more generally to the reconnection of the “Design, project and construction” axis - precisely in order to face some limitations of active participation practices, and to favour the consolidation of this socio-economic model.

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<sup>4</sup> This institution is not solely referable to the advisory dimension, similar to other instruments already in force in the authorization procedures for complex projects (e.g. phase of observations to a SEA procedure or in a service conference). It is also a tool that provides for the identification of alternative and shared solutions.

### *The quali-quantitative approach for the resilience*

The need to act on the built environment reflects the attempt to answer to more or less explicit questions and needs. The arising of new categories of societal needs - as it recently appears with the affirmation of participation practices - should correspond to the definition of approaches, methodologies and tools able to adequately and coherently grasp, interpret and correspond those needs.

The technological culture of the project can help to combine new behaviours and needs with the technical, economic and social feasibility dimension. This is an extension of the traditional disciplinary framework, in the perspective of including new needs, aspirations and values expressed by new categories of clients, users and actors.

More in detail, the expression of new requirements can be read in light of the "demand-performance" approach, as a manifestation of a new class of needs. Within this perspective, the quality objectives and the frameworks to be defined are multiple and concern both the procedural aspects, both the design and implementation ones. Reference is given to the so-called "invisible technology" - thus to the different phases of the process, but also to the interpretation of needs related to the new category of users - and to the specific design, spatial, technological, and constructive elements. The definition of requirements frameworks must correspond to this extension of the demand frameworks, as quality levels that must be achieved.

In this perspective, resilience is configured as a new quality objective, which, facing a complex and inter-scalar framework, is articulated in specific requirements to be matched with certain performance levels. The translation of the notion of resilience in adaptability, transformability and reactivity requirements of a given system - as recognized in literature (Walker et al., 2004) and highlighted above - defines quality objectives directly referable to participation practices.

These notions of resilience reflect the design and implementation dimensions according to the technological-environmental approach. In fact, adaptability can be defined as the ability to adapt to a change by actors involved in processes of transformation of the built environment. In this sense, the organizational-procedural dimension is fully affected by the definition of this requirement/quality level. Transformability refers to the responses of the built environment, as well as of the technological solutions, to the variability of needs or uses. In this case, the physical, design and implementation dimensions are involved. Finally, the reactivity that constitutes the dynamic adaptability of a system to changes in the conditions and availability of resources of a context, may refer to the ability of a specific network of actors to reorganize themselves responding to the changing social, economic, energy and environmental conditions (Angelucci et al., 2013).

On the basis of a renewed framework of needs and requirements, that also



include the impact of resilience as new levels of quality, it is necessary to define evaluation and control tools that allow to govern the quality of the project (Angelucci et al., 2015).

An evaluation and control tool may consist in defining indicators relating to the achievement of the requirements. Given the wide range of possible applications, these are both quantitative and qualitative indicators, able to take the form of parameters, in the case of measurable and comparable characteristics and quantities, as well as the descriptive form for verifying conditions, evaluating and expressing judgments. The application of indicators constitutes a management control system that can allow the achievement of different objectives. First of all, it allows to measure and to evaluate the contribution of each component of the system with reference to the conservation and/or increase of resilience. It also allows to identify the intervention points of the process. Finally, the indicators allow to compare experiences and projects, providing at the same time fruitful information about the entire phenomenon.

In these terms, the monitoring of the “quality-resilience” can contribute to face many of the limits identifiable in the current situations with reference to the participation practices on the common goods, at the same time to strengthen the triad “concept-design-realization” (Mussinelli, 2014; Losasso, 2017), strongly recalled by the technological-environmental design culture.

### *Conclusion*

With respect to the arguments here delineated, the contribution of the technological-environmental approach within the practices of active citizenship in a resilient perspective constitutes a possible field of research and innovation, whose potential is still to define and to fully understand. This contribution - in coherence with others in the Architectural Technology field - identifies some possible subjects of examination.

From the analysis of the phenomenon of the active citizenship some findings have emerged, setting the necessity to pursue a “multi-scalar” and “multi-dimensional” approach, in which the quality of the housing space respects both the measurability of the efficiency of the single interventions, in terms of process and of design-constructive aspects, and the subjective qualities of living the city, as expected and perceived by the users. The systemic approach, involving the whole settlement system and its inhabitants, can open new operational scenarios for the area of technological-environmental design and to give answers through a inter-systemic and inter-scale planning, referred to the built environment in its totality, operating in the logic of a broader “glocal” project for the contemporary “collaborative and horizontal” world (Rifkin, 2011). In this view, the community-evolutionary dynamics that are revolutionizing the territories are inserted in a smart logic, which, applied to the city and the land, triggers

subsidiarity mechanisms that widen the horizons to new forms of democracy and to the creation of smart community dynamics.

Through a review of the demand-performance approach, the resilience is set as new quality objective to pursue in terms of reactivity, adaptability and transformability of the system. The possibility not only to govern the quality of the project but also to measure it focuses, as underlined, to the necessity to equip with multidimensional tools of evaluation, with which to be able to attribute the weight of every component of the system with respect to the achievement of a resilient balance. The indicators become therefore real “resilience indicators”, able to return the measure of the ability of the participated processes to produce adaptation and change in various fields.

The recognition of the necessity to act both on the process and on the spatial-design levels -a distinctive element of the technological-environmental design approach - subtends the objective to recover and to strengthen the relationship between humans and places, humans and environment, humans and landscape (Braz Afonso, 2015), or the need of reappropriation of the space at the base of many active citizenship initiatives.

The reaffirmation of the “disciplinary specificity” of the architect-technologist - updating the quality objectives of the project and with a renewing the practices of “project production” - constitutes a fundamental element to re-establish and to strengthen the role of the designer in the contemporary scenario. This is characterized, as delineated, also from the affirmation of the articulated and heterogeneous phenomenon of the practices of active citizenship, as an actor able *«to govern the quality and the functionality of the anthropic space, for an aesthetical dimension of the places, of the buildings and of the objects that populate the landscape»* (Schiaffonati, 2017).

## REFERENCES

### The link between resilience and participation. perspectives of technological research

- Amirante, I. (2008), “Spazi per l’incrocio di saperi”, in La Rocca, F. e Valente, R., *Lo sguardo e l’identità, riflessioni sui sistemi dei luoghi e degli oggetti*, Alinea, Firenze.
- Angelucci, F.; Di Sivo, M. and Ladiana, D. (2013), “Reattività, adattabilità, trasformabilità i nuovi requisiti di qualità dell’ambiente costruito / Responsiveness, Adaptability, Transformability: the new quality requirements of the built environment”, in *Techne Journal of Technology for Architecture and Environment*, vol. 5, pp. 53-59.
- Angelucci, F.; Rui Braz A.; Di Sivo, M. and Ladiana, D. (2015) *The Technological Design of Resilient Landscape. Il progetto tecnologico del paesaggio resiliente*, FrancoAngeli, Milano.
- Angelucci, F.; Cellucci, C.; Di Sivo, M. and Ladiana, D. (2015), “Qualità misurabile e qualità vissuta della città. La rigenerazione urbana come riconnessione tecnologica tra risorse, spazi, abitanti / The Measurable and the Real Quality of Life in the City. Urban regeneration as a technological correlation of resources, spaces and inhabitants”, in *Techne. Journal of Technology for Architecture and Environment*, vol. 10, pp. 67-76.
- Antonini, E. and Tucci, F. (eds) (2017), *Architettura, Città e Territorio verso la Green Economy. La costruzione di un Manifesto della Green Economy per l’Architettura e la Città del Futuro | Architecture, City and Territory towards a Green Economy. Building a Manifesto of the Green Economy for the Architecture and the City of the Future*, Edizioni Ambiente, Milano.
- Arnaldi, S. (2012), “Anticipazione e scelte tecnologiche”, in Arnaldi, D. and Poli, R. (eds), *La previsione sociale*, Carocci Editore, Roma, pp. 121-131.
- Baek J.S.; Manzini, E. and Rizzo, F. (2010), “Sustainable collaborative services on the digital platform: Definition and application”, available at: [www.drs.unmontreal.ca/data/PDF/005.pdf](http://www.drs.unmontreal.ca/data/PDF/005.pdf).
- Bobbio, L. and Pomatto G., “Il coinvolgimento dei cittadini nelle scelte pubbliche”, in *Meridiana*, vol. 58, pp. 1000-1024.
- Bollier, D. (2015), *La rinascita dei Commons. Successi e potenzialità del movimento globale a tutela dei beni comuni*, Stampa Alternativa, Roma.
- Bologna, R.; Rogora, A.; Cafiero, G. and Annunziato, M. (2017) “Risposta alle emergenze sociali, promozione del benessere abitativo e della partecipazione”, Antonini, E. and Tucci, F. (eds), *Architettura, città e territorio verso la Green Economy. La costruzione di un Manifesto della Green Economy per l’Architettura e la Città del Futuro | Architecture, City and Territory towards a Green Economy. Building a Manifesto of the Green Economy for the Architecture and the City of the Future*, Edizioni Ambiente, Milano.
- Borella, G. (ed), *Colin Ward. Architettura del dissenso*, Elèuthera, Milano.
- Braz Afonso, R. (2015), “In favour of a Culture that cultivates Relationships” in Angelucci, F., Rui Braz A., Di Sivo, M. and Ladiana, D., *The technological design of resilient landscape. Il progetto tecnologico del paesaggio resiliente*, FrancoAngeli, Milano.
- Campoli, A. (2014), “Un progetto per la tecnologia dell’architettura”, VV.AA., *La cultura tecnologica nella scuola milanese*, Maggioli, Santarcangelo di Romagna, pp. 163-170.

- Carrara, G.; Fioravanti, A.; Loffreda, G. and Trento, A. (2014), *Conoscere collaborare progettare: teoria tecniche e applicazioni per la collaborazione in architettura*, Gangemi, Roma.
- Cellucci, C. (2016), “Accessibilità dell’ambiente domestico”, in Lucarelli, M.T.; Mussinelli, E. and Trombetta, C. (eds), *Cluster in progress. La Tecnologia dell’architettura in rete per l’innovazione*, Maggioli, Santarcangelo di Romagna, pp. 53-66.
- Cellucci, C. and Di Sivo, M. (2016), *Habitat contemporaneo. Flessibilità tecnologica spaziale*, FrancoAngeli, Milano.
- Ciribini, G. (1978), *Introduzione alla tecnologia del design: metodi e strumenti logici per la progettazione dell’ambiente costruito*, FrancoAngeli, Milano.
- Clemente, C. (2016), “Marginali, dimenticati, dismessi”, in Clemente, C. and Baiani, S. (eds), *Il progetto tecnologico per la riqualificazione di spazi dimenticati*, Edizioni Nuova Cultura, Roma,
- CNAPPC-CUIA (2017), *Verso una strategia di sistema per l’architettura italiana: formazione, ricerca, professione*, Conferenza Nazionale sull’Architettura, Roma.
- COM (2009), *Preparare il nostro futuro: elaborare una strategia comune per le tecnologie abilitanti fondamentali nell’UE*, Bruxelles.
- Commissione Rodotà (2007), *Elaborazione dei principi e criteri direttivi di uno schema di disegno di legge delega al Governo per la novellazione del Capo II del Titolo I del Libro III del Codice Civile, nonché di altre parti dello stesso Libro ad esso collegate per le quali si presentino simili necessità di recupero della funzione ordinante del diritto della proprietà e dei beni*, available at: [www.giustizia.it](http://www.giustizia.it).
- CSIRO, Arizona State University, Stokholm University (2007), “Urban Resilience Research Prospectus. A Resilience Alliance Initiative for Transitioning Urban Systems towards Sustainable Futures”, available at: [www.citiesforpeople.ca](http://www.citiesforpeople.ca).
- De Carlo, G. (1973), *L’architettura della partecipazione*, Il Saggiatore, Milano.
- de Certeau (1980), *L’invenzione del quotidiano. 1 Arts de faire*, Gallimard, Paris (It. tran., *L’invenzione del quotidiano*, Edizioni Lavoro, Roma, 2010).
- Di Sivo, M. (2016), “Introduzione”, in Di Sivo, M. and Cellucci, C., *Habitat contemporaneo. Flessibilità Tecnologica e spaziale*, FrancoAngeli, Milano.
- Dierna S. and Orlandi F. (2005), *Buone pratiche per il quartiere ecologico: linee guida di progettazione sostenibile nella città della trasformazione*, Alinea, Firenze.
- Drift (2014), “Impact study of citizen’s initiative ‘de Luchtsingel’ for the city of Rotterdam”, available at: [www.drift.eur.nl](http://www.drift.eur.nl).
- EEA (2016), *Urban adaptation to climate change in Europe 2016 - Transforming cities in a changing climate*, EEA Report n. 12, European Environment Agency, Copenhagen, Denmark.
- Fabbricatti, K. (2013), *Le sfide della città interculturale. La teoria della resilienza per il governo dei cambiamenti*, FrancoAngeli, Milano.
- Fianchini, M. (2017), “La dimensione della conoscenza nell’intervento sul costruito. L’evoluzione dei modelli di analisi prestazionale tra teorie e prassi”, in *Techne Journal of Technology for Architecture and Environment*, vol. 13, pp. 159-164.
- Folke, C., Carpenter, S.R., Walker, B., Scheffer, M., Chapin, T. and Rockstrom, J. (2010), “Resilience Thinking: integrating Resilience, Adaptability and Transformability”, in *Ecology and Society*, vol. 5, n. 4.
- Forlani, M. C.; Mussinelli, E. and Daglio, L., (2016), “Tecnologia, ambiente e progetto” in Lucarelli, M.T., Mussinelli, E. and Trombetta, C. (eds), *Cluster in progress. La Tecnologia dell’architettura in rete per l’innovazione*, Maggioli, Santarcangelo di

- Romagna, pp. 198-209.
- Friedman, Y. (2009), *L'architettura di sopravvivenza. Una filosofia della povertà*, Boliati Boringhieri, Torino.
- Fondazione Unipolis (2015), *Dalla sharing economy all'economia collaborativa. L'impatto e le opportunità per il mondo cooperativo*, available at: [www.fondazioneunipolis.org](http://www.fondazioneunipolis.org).
- Gangemi, V. (ed) (2001), *Emergenza ambiente. Teorie e sperimentazioni della progettazione ambientale*, Clean, Napoli.
- Giallocosta, G. (2011), "Tecnologia dell'architettura e progettazione tecnologica / Architectural Technology and Technological Planning", in *Techne. Journal of Technology for Architecture and Environment*, vol. 2, pp. 24-31.
- Guarniero, G. (1992), "Gli orientamenti attuali della disciplina normativa", in Ciribini, G. (ed), *Tecnologie della costruzione*, La Nuova Italia Scientifica, Roma, pp. 59-92.
- Guazzo, G. (1984), "Progettare in un campo di variabilità", in Guazzo, G. e Cocchioni, C. (eds), *Progetto e qualità ambientale. Abitare e vivere in un campo di variabilità*, Vestro, Roma.
- Guazzo, G. (2003) "I molti modi" del pensiero progettuale", in Bertoldini M. and Zanelli A. (eds), *Tecnica, progetto e scienze umane*, CLUP, Milano.
- Guazzo, G. (2004), "La cultura tecnologica della progettazione", in Bertoldini, M.; Campioli, A. and Mangiarotti, M. (eds), *Spazi di razionalità e cultura del progetto. Omaggio a Guido Nardi*, CLUP, Milano.
- Holling, C.S. (1973), "Resilience and stability of ecological systems", *Annual Review of Ecology and Systematics*, vol. 4, pp. 1-23.
- Iaione, C. (2015), "Governing the Urban Commons", *Italian Journal of Public Law*, vol. 1, pp. 170-221.
- Fabbricatti, K. (2013), *Le sfide della città interculturale. La teoria della resilienza per il governo dei cambiamenti*. FrancoAngeli, Milano.
- Koreman, K. and Van Boxel, E. (2015) *City of Permanent Temporality*, NAI, Rotterdam.
- Lauria, A. (2015), "Approccio esigenziale-prestazionale e qualità dell'abitare", in Claudi de Saint Mihiel, A., *Tecnologia e progetto per la ricerca in Architettura*, Clean, Napoli.
- La Creta, R. (1994), "L'architetto tra tecnologia e progetto", in La Creta, R. and Truppi, C. (eds), *L'architetto tra tecnologia e progetto*, FrancoAngeli, Milano.
- Lefebvre, H. (1968), *Le droit à la ville*, Éditions Anthropos, Paris.
- Lepik, A. (2010), *Small Scale, Big Change: New Architectures of Social Engagement*, The Museum of Modern Art, New York.
- Lévy, P. (1994), *L'intelligence collective. Pour une anthropologie du cyberspace*, Éditions La Découverte, Paris.
- Loorbach, D. (2010), "Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework", *Governance. An International Journal of Policy, Administration, and Institutions*, vol. 23, n. 1, pp. 161-183.
- Losasso, M. (2017), "Progettazione ambientale e progetto urbano", in *EcoWebTown*, vol. 2, n. 16, pp. 7-16.
- Losasso, M. (2017), "Tra teorie e prassi: cultura, tecnologia, progetto / Between theories and practices: culture, technology, design", in *Techne. Journal of Technology for Architecture and Environment*, vol. 13, pp. 9-13.
- Lydon, M. and Garcia, A. (2015), *Tactical Urbanism. Short-term Action for Long-term Change*, Island Press, Washington.

- Maciocco, G. e Tagliagambe, S. (1997). *La città possibile. Territorialità e comunicazione nel progetto urbano*, Dedalo, Bari.
- Maldonado, T. (1987), *Il futuro della modernità*, Feltrinelli, Milano
- Manzini, E. (2012), “Error-Friendliness: How to Deal with the Future Scarcest Resource: The Environmental, Social, Economic Security. That is, How to Design Resilient Socio-Technical Systems”, in *Architectural Design*, vol. 82, n. 4, pp. 56-61.
- Manconi, L. (2015), *Strumenti normativi per la partecipazione*, Formez PA, Dipartimento della Funzione Pubblica.
- Manzini, E. (2015), *Design when everybody designs: An introduction to Design for social innovation*, MIT Press, Cambridge.
- Manzini, E. and Rizzo, F. (2017), “Small projects/large changes: Participatory design as an open participated process”, *CoDesign. International Journal of CoCreation in Design and the Arts*, vol. 7, pp. 199-215.
- Marzi, L. and Pellecchia, D. (2008), “Processi, metodi e strumenti per la perimetrazione del tema”, *La ricerca a fronte della sfida ambientale. Materiale del III seminario OsDotta*, Firenze University Press, Firenze.
- Mattei, U. (2011), *Beni comuni. Un manifesto*, Laterza, Bari.
- Meroni, A. (ed) (2007), *Creative communities: People inventing sustainable ways of living*, POLL.design, Milano.
- Mezzi, P. and Pelizzaro, P. (2016), *La città resiliente. Strategie e azioni di resilienza urbana in Italia e nel mondo*, AltraEconomia, Milano.
- Molinari, C. and Campioli, A. (1994), *Formazione per il progetto. Progetto della formazione. Metodi, tecniche e nuovi operatori per una gestione innovativa dell'attività progettuale*, FrancoAngeli, Milano.
- Morin, E. (1983), *Il metodo. Ordine, disordine, organizzazione*, Feltrinelli, Milano.
- Mussinelli, E. (2014), “Identità della ricerca nella progettazione tecnologica ambientale”, in Coordinamento dei Ricercatori di Tecnologia dell'architettura del Politecnico di Milano (ed), *La cultura tecnologica nella scuola milanese*, Maggioli, Santarcangelo di Romagna.
- Nardi, G. (2010), *Percorsi di un pensiero progettuale*, Maggioli, Santarcangelo di Romagna.
- Ostrom, E. (2009), *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press, Cambridge.
- Pasi, G. (2015), “I Social Impact Bond per il recupero delle aree urbane”, available at: [www.secondowelfare.it](http://www.secondowelfare.it).
- Perriccioli, M. (2003), “I paradigmi del progetto responsabile”, in *Incontri dell'Annunziata. Giornate di studio sull'innovazione tecnologica*, Atti V e VI edizione, Facoltà di Architettura, Ascoli Piceno.
- Perriccioli, M. (ed) (2005), *La temporaneità oltre l'emergenza. Strategie insediative per l'abitare temporaneo*, Edizioni Kappa, Roma.
- Perriccioli, M. (2008), “Presentazione”, in Perriccioli, M. (ed), *Incontri dell'annunziata. Giornate di studio sull'innovazione tecnologica. Atti V e VI edizione*, SIMPLE, Macerata.
- Pillon, A. (2016), “Dibattito pubblico, un'opportunità anche per l'Italia / Public debate, an opportunity also for Italy”, in *Techne. Journal of Technology for Architecture and Environment*, vol. 11, pp. 45-49.
- Raiteri, R. (2003), “Innovazione, ambiente, responsabilità”, in Perriccioli, M. (ed), *Incontri dell'annunziata. Giornate di studio sull'innovazione tecnologica. Atti V e VI*

- edizione, SIMPLE, Macerata.
- Ratti, C. and Claudel, M., (2014), *Architettura Open Source. Verso una progettazione aperta*, Einaudi, Torino.
- Rifkin, J. (2011), *The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy, and the World*, Palgrave Macmillan, Basingstoke.
- Sacconi, L. and Ottono, S. (eds) (2015), *Beni comuni e cooperazione*, Il Mulino, Bologna.
- Schiaffonati, F. (2008), “Le origini del progetto partecipato”, in Vitrano, R.M., *Architettura strategica. Tecnologie e strategie del progetto partecipato*, Luciano, Napoli.
- Schiaffonati, F. (2011), “La finalità della progettazione nella formazione dell’architetto e dell’ingegnere / Design in the educational process for architects and engineers”, in *Techne Journal of Technology for Architecture and Environment*, vol. 2, pp. 52-59.
- Schiaffonati, F.; Mussinelli, E. and Gambaro, M. (2011), “Tecnologia dell’architettura per la progettazione ambientale / Architectural technology for environmental design”, in *Techne Journal of Technology for Architecture and Environment*, vol. 1, pp. 48-53.
- Schiaffonati, F. (2017), “Per una centralità della figura dell’architetto”, in *EcoWebTown. Journal of Sustainable Design*, vol 2, n. 16.
- Tagliagambe, S. (1998), *L’albero flessibile. La cultura della progettualità*, Zanichelli, Bologna.
- United Nations - Habitat III Secretariat (2017), *New Urban Agenda*, available at: <http://habitat3.org/wp-content/uploads/NUA-English.pdf>.
- Urwin, K. and Jordan A. (2008), “Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance”, in *Global Environmental Change*, vol. 18, n. 1, pp. 180-191.
- Venturini, G. and Venegoni, C. (2016), *Re-Act, Tools for Urban Re-Activation*, vol. 1, D Editore, Roma.
- Verganti, R. (2004), “Cultura politecnica e processi innovativi: il progetto di Guido Nardi per i ricercatori politecnici”, in Bertoldini, M.; Campioli, A. e Mangiarotti, M. (eds), *Spazi di razionalità e cultura del progetto. Omaggio a Guido Nardi*, CLUP, Milano.
- Vittoria, E. (1975), *Argomenti per un corso di tecnologia dell’architettura*, Multigrafica Brunetti, Roma.
- VV.AA. (2015), “La sfida della resilienza urbana”, *Tria Rivista internazionale semestrale di cultura urbanistica*, vol. 8, n. 2.
- Walker, B.; Holling, C. S.; Carpenter, S. and Kilzig, A. (2004), “Resilience, Adaptability and Transformability in Social-ecological Systems”, in *Ecology and Society*, vol. 9, n. 2, disponibile al sito: <http://www.ecologyandsociety.org/vol9/iss2/art5>.
- World Commission on Environment and Development (1987), *Our Common Future*, Oxford University Press, Oxford.