

Antonio Leone Carmela Gargiulo
Editors

Environmental and territorial modelling for planning and design



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Smart City, Urban Planning for a Sustainable Future

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MODELS AT THE TIME OF WEAK PLANNING

THEIR ROLE, IF ANY

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ABSTRACT

If the present weak character of planning is generally undisputed, such weakness can be actually observed on several aspects. There is an objective notion of weakness, due to the feeble role planning has actually played in managing the territorial development, with scarce effects on its dynamics. On this regard, planning is said to be weak, as it actually lacks the strength and incisiveness it once was assigned. Another notion of weakness is proposed as resulting from a dialogical vision of planning, often and variously referred to as advocacy planning, equity planning, progressive planning, participatory planning, collaborative planning, community-based planning: a weakness deriving from renouncing to design and realize scenarios, for rather managing the decision process, interacting with citizens and communities. On this last regard, planning is weak as aimed at organizing a process rather than providing a product.

A third kind of weakness could be said programmatic, as deriving from a different role some suggest it ought to play: not to be intended as an oriented action towards a desirable state, but rather as a system of rules aimed at regulating the development of settlements by means of the definition of what can be made and the prohibition of what is excluded. On this second regard, planning is said to be weak, as it is hoped to renounce its traditional assertive and 'strong' role. In light of such variety of meanings, the question of the current role of models as planning support tools should properly be posed with reference to the different meanings of weakness, so as to provide different responses. What is the purpose and the content of the present paper.

KEYWORDS

Urban Models; Urban Planning; Self-Organization; Participatory Planning; Negative Planning

1 INTRODUCTION

It is now generally acknowledged as an oft-repeated expression, almost a platitude, that our times are characterized by a weak role of planning, so that such weakness appears suitable for identifying this long-lasting season of regional and urban planning. As far as models are concerned, it is therefore appropriate and interesting to discuss the role they can actually play within such a framework. In its broadest sense, the weak attitude in planning can be acknowledged as the wide and general consequence of the profound epistemic and cultural changes occurred in the late 20th century (Kuhn, 1970): on the one hand, it embraces the epochal sunset of positivistic trust in the rational-comprehensive values, that is the reliance in the capacity of the rational evaluation and decision making processes to comprehend and direct the individual and collective behavior, so as to plan the organization and development of settlements; on the other hand, it also involves the arising of the wide paradigm that goes under the term of 'complexity science', which acknowledges the system dynamics as the uncertain outcome of feedback mechanisms - unpredictable and non-linear – as well as the result of self-organization phenomena. In the transfer from the scarcity society to the risk society (Chernomas, 1984), a deterministic view, based on certainty and linearity, is replaced by a condition of global uncertainty (Beck, 2000). Such uncertainty actually undermines any possible anticipation or prefiguration of scenarios to come, not to say the reliability of any aspiration or pretension to shape them: what precisely should be the purpose and sense of planning, which therefore can only result intrinsically weak. Yet, if we go beyond the general sense of unpredictability that derives from the fall of rational certainty, if we more specifically look into the often discussed question of weak planning, here things get more varied, showing different forms of weakness.

2 WHICH WEAKNESS

In the last years the claimed weakness of urban planning has been so recurring as to become an "umbrella term", suitable for covering different meanings and supporting different purposes: closing that umbrella and exposing the several meaning it covers will be here assumed a preliminary task in order to discuss the role models can actually play as a planning support.

An objective notion of weakness has been for years tangible and widely denounced: our times are undoubtedly characterized by a feeble role of planning, which, as a matter of fact, appears scarcely influential on the territorial dynamics that on paper it should be expected to manage. Since the late '70s, when town plans were regarded as fixed and unquestionable landmarks, prominent interventions and great urban transformations have often occurred setting them aside, when not even plainly disregarding their provisions.

The plan themselves, once prescriptive guidelines and mandatory shapers of territorial scenarios, have become just feeble regulatory references, easily amendable and widely editable according to agreements or incidental occurrences. Starting from the critique of the plan as an impediment to initiative and enterprises, the role of planning has gone becoming more and more subordinated to the economic instances. At the same time, fought under different vessels and emphasized by recurring passwords such as deregulation, streamlining, simplifying, facilitating, the battle against the authoritative plan and the rational-comprehensive principle of the cascaded procedural system of Law 1150/1942 has gone demolishing the idea that the urban development should comply with (and tend to) a prearranged pattern and design, or at least to correspond a general shared framework; what has deprived urban planning of most of its actual

strength. Planning is hence weak, as it actually lacks the strength and incisiveness it once was plainly credited with. Another meaning of weakness results from a dialogical vision of planning, arising from the *"transizione dalle ipotesi fondative dell'urbanistica come forma di razionalità forte a forme argomentative più vicine alle dimensioni etiche e ai requisiti della disciplina come scienza sociale applicata"* (Maciocco, 1995): different planning approaches, which have been variously named and referred to as advocacy planning, equity planning, progressive planning, participatory planning, collaborative planning, community-based planning: all those approaches appear sharing the strategic role of communication and information, which are assumed as a decisive source of power in the decision making process.

In such a view, planning is weak in that it does not prefigure scenarios resulting from choices, nor it provides design solutions: it only manages the decision process in a context of dialogical interaction and debate with citizens and communities: *"progressive planning (...) is at once a democratizing and a practical organizing process"* (Forester, 1989). Shortly, planning is weak in that it is aimed at organizing a process rather than at providing a (spatial or functional) product: it *'consists of the elements of envisioning a problem situation, managing arguments concerning it, and negotiating strategically to intervene'* (Forester, 1989). A further notion of planning weakness, which appears increasingly widespread and shared over time, could be said programmatic, as it derives from the recommendation of a completely different role of planning, resulting from the epistemic change that was mentioned above.

Juval Portugali identifies such a radical change of paradigm as the first dilemma with planning: *'It became evident that 'rational comprehensive planning' (...) is an irrational assumption, that planning is a political, incremental (...) and essentially 'non-scientific' and non-technical process; it became apparent that (...) the spectacular scientific instruments we've developed fail to tame the city, the metropolis, the megalopolis, the environment (...), that beautiful scientific instruments such as the gravity, interaction, or entropy maximization models (...) can hardly scratch the complexity of the urban scenario'* (Portugali, 2000). The continuity of the rational process going from knowledge to action – anchored in the words of Auguste Comte *'science, d'où prévoyance; prévoyance, d'où action'* – seems to break. No longer planning can be intended as an oriented action towards a desirable state; no longer the term 'planning' is acknowledged in its literal meaning, that is 'making plans', or shaping a scenario to be realized. The aim is then to solve the lexical chunk of planning as a predictive/prescriptive action, assuming a weak way of planning (a planless planning) in place of a strong (assertive) role.

A possible *'planless planning'* can be provided by the shift from a teleological vision – targeted to achieve a prefigured arrangement – to a nomological approach – aimed at defining a system of general and abstract rules: this, which was also called 'urban code', can be a set of qualitative guidelines concerning buildings shape and location (Alfasi & Portugali, 2007) or, differently, a set of abstract and generic rules, aimed at regulating the development of settlements defining what can be made by means of the prohibition of what is excluded (Moroni, 2007; Moroni, 2013).

Such view embodies the 'negative role' that Blečić and Cecchini suggest as an essential requirement of robustness and antifragility of planning: negative planning as intended to explicitly state what cannot be done (of soil, of areas, of buildings), in place of the traditional 'positive', assertive role of planning, suitable for defining a target and the path to reach it (Blečić & Cecchini, 2016).

As a matter of fact, this is not an unprecedented view: in the second half of the XIX century, several town plans were limited to merely defining the infrastructural skeleton of the settlement, leaving wide and undetermined the areas inside this major grid to be shaped for housing, available for the location of any kind of activities, according to the *'sviluppo che prenderà la fabbricazione nell'una o nell'altra parte della città'* and

the *'probabili innovazioni che saranno per emergere dal presente stato di transizione dell'arte edilizia* (Boriani et al., 1992); in fact the Beruto Plan of Milan, in its first version of 1863 - which for the same reason was denied the requested acknowledgement of 'public usefulness' by the Ministero dei Lavori Pubblici -, may well be taken as an example of such approach (Boriani et al., 1992). Not new then, such a weak role of planning has been re-emerging in these last decades, as a consequence of the arising crisis of the urban masterplan as well as a possible way to overcome its criticalities.

Beside the division of the masterplan into three different phases (structural, operational and regulatory) – as proposed in 1995 in the XXI INU conference, and variously accepted and applied in several Italian regions – and its disempowerment by means of a widespread deregulation, a weak way of planning, intended to abandon a teleological vision for a nomocratic approach – and the plan itself for a set of abstract and generic rules – has gone gaining an increasing consensus in the recent years. If a nomocratic view of planning actually appears capable to overcome the problems of inefficacy, inefficiency and iniquity the masterplan was imputed of, yet a couple of questions seems to arise.

First, a methodologic matter: a nomocratic approach, as merely aimed at regulating individual actions and behavior, setting aside the making of a targeted state, assumed as desirable, involves a non-consequentialist position, so as to disregard the effects of such actions. Yet, some authors notice that a regulatory way of planning does anyhow involves precise and concrete effects on the inner geography of settlements: *'history shows that the effect of rules on pattern, use and form has not been trivial'* (Talen, 2012); and those effects, far less visible than in traditional planning, cannot but be thoroughly regarded. Not to talk of the relevant effects that a traditional (and unavoidable) way of planning infrastructures and public facilities obviously involves (Moroni, 2013), which cannot but deform and preconditioning the playfield of individual actions and behaviours: which, on the contrary, ought to be neutral and objective. What imposes to re-assume a consequentialist approach, in order to appraise and evaluate such effects with reference to some targeted state: a teleological position, radically excluded by the nomocratic approach, appears re-entering through the window, due to the effects of both abstract rules and infrastructural planning.

Second, a matter of efficiency: the individual actions, if freed from assertive planning prescriptions and merely regulated by abstract and general rules, are uniquely subjected to the mechanisms of free housing market; but is market actually capable to provide an efficient resources location? On such point, the presence of externalities and public goods poses some crucial questions (Camagni, 2008): how can housing market avoid (or mitigate) the negative effects caused by the individual actions to anyone not involved in decision making processes, namely private citizens, the whole community or even the future generations? And, how can building and real estate market substitute the traditional (and public) planning of public goods, which, as non-excludible goods, can't be actually priced? Such questions are still open as a subject of heated debate. As it is wide open the matter of the role urban models can play as planning support tools, with reference to the distinct senses of weakness that planning is actually expressing.

3 WHICH ROLE, IF ANY

The trust on the reliability of models and on their effectiveness to reproduce the reality and its dynamics could only be demolished by the radical epistemic change mentioned above: the implicit (and unjustified) associated of quantitative and scientific models with rational-comprehensive approach has made the first rejected with the second, and the baby thrown out with the bathwater.

Seeking to recover the baby out of the water, it should conversely be noted that not all the territorial analysis models are based on a deterministic approach; since the early '70 stochastic elements were

introduced as an improvement of classic models: among them, some relevant studies by Jay Forrester on the non-linear growth dynamics, a probabilistic version of spatial interaction models by Wilson, dynamic and non-linear approaches by Leonardi, Lombardo and Rabino, the first researches of Peter Allen on self-organization processes.

A wide variety of modelling approaches focusing on self-organizing phenomena according to a probabilistic vision has then emerged in the last decades: multiagent systems, cellular automata, boolean networks, SOUDY models, SLEUTH models, *swarm intelligence*, *ant algorithms* – among the others – appear sharing their point of view within the observed phenomenon, the focus on bottom-up processes, non-linear relations, co-evolution and self-organization dynamics.

Furthermore, we can mention the methods that focus on network processes and topological relationships, such as neural networks, Bayesian networks, complex network, small-world networks, space syntax; as well as the use of advanced statistical techniques for the treatment and modelling of data, such as genetic algorithms, data mining, multidimensional scaling and geostatistical and geoprocessing techniques. Materializing an increasing interest in the morphogenetic processes, several research lines have recently gone focusing on the dynamic modelling of urban form: among them, in particular, the spatial analysis, the configurational analysis, the analysis of fractal geometry, the Allen-Sanglier model; and an increasing interest seems to regard the qualitative models of urban space, such as the urban simulation models, the FACS models and the cognitive maps.

All these methods are mentioned to point out that in the era of complexity and uncertainty, well after the epistemic revolution of the last century, a wide range of models, often worked out or made actually feasible by the advances in informatics, has composed a vital toolbox for territorial knowledge; models that share a different approach from the one prevailing in the previous decades, in that they:

- abandon a deterministic logic and present a new attention to the issues of complexity;
- overcome the two-way relationship between model and reality, which they renounce to reproduce in a unique construction;
- are rather proposed as a partial and limited conceptual construction, oriented towards the understanding of single aspects, so that different models may coexist at different scales – one next to the other;
- are frugal, simple and flexible (Cecchini, 1999);
- renounce a rational-comprehensive approach, aimed at validating a vertical decision making process, to work as a tool for understanding and orienting local-scale emergent phenomena, in order to manage self-organization processes;
- on the whole, renounce the pretension to embody a unique and all-encompassing ideological vision, opening towards different possible views.

Even if with different features, urban models are hence still fresh and alive after the epistemic storm of the late 20th century. It remains to be seen if they can still play a role in the present age of weak planning. Apparently, if we assume weakness as feebleness, and planning as poorly influent on urban dynamics and development, we can't but recognize that models – as a support tool of decision making process - actually lose their very *raison d'être*; only, they maintain some general usefulness as a tool for merely describing and interpreting urban contexts; or, mainly at an infra-urban scale, for supporting transparent negotiation processes.

- Nonetheless, it's worth highlighting the role that several models based on a probabilistic vision can play in activating the regeneration of urban deteriorated areas, so as to orient bottom-up processes and manage locally self-organized urban dynamics (cutini, 2018).

Also an assumption of weakness as wide-openness to dialog and negotiation, regarding planning as focusing on the participatory process and does not providing any 'product' to assess and validate, cannot but imply a reduced usefulness of models.

- Nonetheless, models remain undoubtedly useful for enriching the information at our disposal, thanks to their capacity to extract knowledge, to construct scenarios, to simulate effects and phenomena: '*planners (...) can support citizens victimized by an unequal distribution of resources; they can help organize social movements and provide them much needed information and expertise; and they can share with people their understanding of structural factors in urban development.*' (Fischler, 1989).

In order to empower, enhance and diffuse information, it is important to point out prospects offered by the informatics, which were recorded as participatory e-planning (Saad-Sulonen, 2012): by means of web-GIS advanced toolboxes and on-line platforms (such as Plans-on-the-map, Tell-it-on-the-map, Peer-To-Peer Planning), they admittedly allow a more active, capillary and organized participation in the decision making process.

At a first glance, the role of models is apparently negligible also assuming weakness as unassertiveness, that is regarding planning according to a nocratic vision: the abandonment of a teleological approach involves a non-consequentialist vision, which excludes at the roots the need to assess (by means of models) the predictable effects of a planned state, which just does not exist.

- Nonetheless, any code of abstract and general rules must necessarily be accompanied by some specific prescriptions, concerning in particular the streets grid, the location of plants, infrastructures and public facilities, thus subjected to 'positive' planning (Moroni, 2013): and, as it was discussed above, models come into play as a necessary tool for investigating their effects on the presumed neutral playfield of individual actions.

Similarly, models are called into play in order to investigate the consequence on urban geography and form of abstract codes of abstract and generic rules: '*une connaissance urbaine est toujours injectée dans l'urbanisme des règles. Cette connaissance peut nous venir de l'analyse phénoménologique de l'histoire urbaine, ou bien de modélisation à base de règles implementable aujourd'hui sur un support informatique*' (Fusco, 2018).

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Valerio Cutini is Professor of Town Planning in the University of Pisa; since 1996 he teaches Urban Planning at the School of Engineering of the University of Pisa. His main interests and studies are in the areas of the analysis of urban settlements, aimed at focusing on their development and the diachronic transformation of their morphology and functional consistency, investigating the way the design of the built environment affects the patterns of social and economic behaviour of individuals and communities.

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