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Planning for uncertainties / Learning from adaptive complex systems

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The act of planning itself embodies a number of contradictions. Moreover, considering the Albanian context, planning has a strong cultural background that looms over every planning initiative.

It either echoes the five-year plans of the communist regime, or reminds the chaotic development of the difficult transition years to a free market economy. Considering these extremes, discussing about planning in Albania means dragging heavy concealed implications. In these conditions, drafting a General Local Plan[1] in Albania means defining the best possible solution to a very complex problem such as a territory can be, foreseeing every possible problem that would arise in the next 15 years of urban, rural, social, demographic or economic development.

The typical analytical approach to such a problem would be based on the assumption that our reality is highly deterministic and that what stops us for predicting the future is the not precise enough information that we have about the present. So a deeper analysis of the present situation would unveil the possible developments of the future and every planned activity in a territory would result in a precise outcome. This approach is based on the presumption of Pierre-Simon Laplace in 1814 which states that if some entity would know the precise location and momentum of every particle of the universe in a precise moment, the past and the future of the universe would become known.

We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also vast enough to submit these data to analysis, it would embrace in a single formula the movements of the greatest bodies of the universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes (Laplace, 1951)

In the analytical approach, each problem and entity is to be dismounted into the basic components, which can be then analyzed and the recombination of each answer to each specific problem would construct an overall solution to a complex problem. During the years, thank to the advancement of the science and technology, it became clear that the universe doesn't work in that way. It is not physically possible to predict the future state of each particle composing a large quantity of entities interacting among each other, based only on the present state.

Taking the necessary caution, a city can be comparable to such a complex system of interacting entities, perusing conflicting objectives and interacting in unpredictable ways with each other and with the authority. In The Death and Life of Great American Cities, Jane Jacobs defines the city as a problem of organized complexity. She states that differently from the simplicity

Fig1 / View of the city from the castle source / Eranda Janku

problems having one or two variables, and differently from the cases of pure statistical probability of the disorganized complexity, the cities are made up of numerous interacting factors. In these cases, horizontal hierarchical structures would work better than vertical ones that always tend to oversimplify the problems (Jacobs, 1961). Not accidentally, Jacobs chooses the term "organized complexity" which was previously used by Warren Weaver in Science and Complexity for classifying different natures of problems (Weaver, 1948). Warren's work of the 40's of the XX century was focused on solving complex problems like automatically translating text in different languages or defining the best strategy of using a country's resources for winning wars. The solution to these kinds of problems need what Ludwig von Bertalanffy defines as a systemic approach. According to him, the mechanistic description of the behavior of living organisms as the sum of the actions performed by specialized cells as a reaction to conditioned and unconditioned reflexes was not enough for describing all the possible conducts of living organisms (von Bertalanffy, 1968).

Thanks to Bertalanffy's General System Theory, it became possible to inquire and describe complex systems and scientific fields like informatics, cybernetics, game theory, decision-making and network systems.

According to Neil Johnson's Two's Company Three is Complexity, A simple guide to the Science of all Sciences, complex systems are able to evolve and adapt to changing environment passing spontaneously from ordered to disorder states. These systems are characterized by a number of agents generally conflicting for limited resources. This interaction is able to allow the emergence of unpredictable self-organized phenomena (Johnson, 2007).

Understanding that the city development is not governed by rigid cause-effect rules, but acts more like a complex and interacting organism, able to adapt to ever changing environment, allows us to use more effective methodologies of decision-making. Charles Jencks states that modern architecture becomes obsolete, because it is based on a mechanistic and deterministic vision of science (Jencks, 1997). The same statement can be made on some simplistic versions of the modern cities. Based on the mechanistic paradigm that the city should work as a machine, city planning in Albania, during the second half of the XX century was mainly done by defining zones of homogeneous land use and urbanism indexes. Simplifying the complexity of the cities, this approach proposed a direct correlation between the number of inhabitants and the quantity of services, trying to create a perfect and efficient city for a perfectly predictable future.

1 / The General Local Plan is the document that defines the development strategies, rules and regulations of the entire territory of a municipality in Albania for a 15 years period. It is a legal obligation for the municipalities to draft it and all future developments have to comply with this plan.

The first problem with a perfectly mechanistic city would arise with the changing of the boundary conditions of the system. A difference in the predicted social or economical conditions would require a deep reorganization of the entire city structure in order to cope with the new environment. This effort would require time and precious resources that are not always available in times of profound changes. Most importantly, a strongly deterministic system would require, in times of changes, a very strong and centralized authority. It would be this authority's task to redesign and readapt the entire city to the new conditions.

The limits of this kind of urban planning were obvious in Albania after the fall of the communist regime. The two problems of the deterministic approach to urban planning arose simultaneously. A deep change occurred at the fundaments of the socio-economic system and, at the same time, the strong and central authority disappeared.

The major cities, as Jonson would expect a complex system to do, stayed away from an equilibrium state and spontaneously passed from an order to a disordered and then to a new kind of ordered state. Counterintuitively a not centrally controlled city was able to adapt to the new economic paradigm faster than the authorities that lacked behind. And the city did so by following the patterns of a complex system being able to evolve thanks to the interaction of the multitude of agents in the territory.

Considering the contemporary condition of the global economy, static systems are doomed to fail. In an ever-changing environment, constantly threatened by financial, demographic, political and environmental crisis, planning a deterministic city where the land use is fixed for a 15 years period is not realistic and undermines the real potentials of the territory. A city that is able to build on the adapting and evolving potential of a complex system would be competitive on a regional context and ultimately would be able to offer better living conditions for its inhabitants, staring a virtuous cycle that would allow the emergence of unpredictable behaviors.

A shift in the mentality of the planner and authority is crucial for allowing the emergence of positive feedback spirals. Embracing uncertainty would mean being able to use at the maximum potential the ability of complex system to solve complex problems in unpredictable ways. Some future guidelines can be drawn at this point. An overregulated city is not able to adapt to new global or local challenges. By eliminating redundancies and errors, a sterile system will develop. On the other side, some degrees of self-organization would allow more interactions between the agents in the territory, enhancing the emergence of complex and horizontal hierarchical structures, able to better respond to everyday challenges. In this sense, order should not be considered as an imposed rule, but as an emergent behavior of the city (Bregasi 2016).

Fig2 / Shkodra estuary
source / Eranda Janku

Since the basis of the analytical procedure for understanding the city are questioned, new methods of planning are necessary. These methods should consider the paradigmatic change needed for managing complex systems. Only by accepting planning methods that are borrowed from the complexity science would be possible to have urban environments that are able to deal with contemporary crisis.

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