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Strategies and monitoring instruments for a correct land use¹

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Abstract The evolution of urban planning has seen gradually emerging models based on a clear separation between the phase of knowledge and that of choices, with an increasing role for a third step, evaluation, as a link between the two. Recently, the increased focus on the issue of land use has transformed the monitoring tools in the objectives of government land policies. This would have required a radical rethinking of the approach, as also is confirmed by the very disappointing results of the policies.

In this paper we propose to investigate the causes of the failure of the soil consumption policies of reduction, focusing mainly on two aspects: the analysis of the structural causes and the effectiveness of the knowledge and monitoring instruments.

In particular, for the latter issue, we explain, also with examples, the possible role of the cadastral and Real Estate Market Observatory databases to support the phase of knowledge in urban planning.

¹ The contents of this paper are the responsibility of the authors and do not necessarily reflect the position of the Institution to which the same relate.

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INTRODUCTION: WHAT IS THE ROLE OF KNOWLEDGE?

What is currently the role of knowledge in the construction of urban planning and land management policies?

This is perhaps the key question in the land management which cannot find a new framework at the national level (Properzi, 2003b) but which had complex and diversified evolution at regional level (Las Casas, Properzi, 2002; Properzi, 2003a).

Traditionally, in the discipline of urban planning the analysis of the territorial and urban context has represented an internal step in the planning process and functional to it: each plan had a voluminous section regarding historical, cartographic and statistical data necessary to support proposal choices.

In the course of time, this approach, has shown at least a few limitations:

- excessively complexity in the acquisition and processing of information;
- limited "verifiability" of the product.

In fact, for a long time, the main guarantee of the plan quality has been represented by the planner authoritativeness, as the archistars in the architectural projects, not surprisingly, the Italian urban planning school, unlike that Anglo-Saxon school, draws its origin in the architectural culture (La Seta, 1976; Mioni, 1980).

This situation has sparked a debate in the discipline, which have progressively shown the need for a radical change, moving from a neo-utilitarian approach, which is focused on objectives, to neo-contractual approach, based on a clear separation between the knowledge and decision-making phases (INU, 2014).

Therefore, the link between knowledge and planning would become the third phase evaluation that, completes the entire process of land management by comparing costs and benefits, objectives and results.

For this experimentation the regional level was the most prolific; many regions drafted instruments for knowledge, such as territorial databases. In fact, each region has its own instrument: "Statuto del Territorio" in Toscana, "Carte della conoscenza" in regions as Abruzzo, Basilicata and Calabria, "Quadri conoscitivi" in many other cases. Therefore, the Italian neo-contractual revolution of urban planning has begun to translate, from academic aspiration, into an operational model.

The soil "consumption": objective or instrument?

Although, then, with ups and downs and so not always homogenous, the evolution of the discipline now seems to have embarked on a comprehensive and, in many ways, reasonable reform path: on the one hand, developing a "technical" knowledge of the territory, able to illustrate constraints (natural and legal), criticality and potential; on the other hand, recognizing the inevitably discretionary and "political" character of planning, entrusting the evaluation the delicate, but necessary, role of verification of compatibility between objectives and physical resources, including the short-term and long-term outlooks.

To complicate this methodological system, that was apparently so clear, has been the affirmation of the "soil consumption" as a central element of the debate on urban planning and land management.

The evaluation of the impacts of the transformation of the territory and planning of urban settlements on the balance relating to land use, in fact, was never absent even in previous historical periods, both in disciplinary debate and in its operative translations; consider, for example, the traditional utilisation of the "Soil use" maps within the plan documents, at various levels, aimed at

verifying a correct relationship between the choices and the potential of the territory, in all its components.

The increasing sensitivity to the systemic implications of the waterproofing of soil processes, especially in the long term, has however progressively brought a growing part of the scientific and intellectual community to give the subject a kind of self-reference.

Land use, by building tool and verification of planning policies and plan, has turned into objective itself, resulting in a new and far less defined interpretation of the relationship between neo-utilitarian approach and neo-contractual approach (Di Ludovico, Properzi, 2005).

To find an analogy with an “overturning” of this sort, we can refer, for example, to the European Community Treaties, where, in terms of economic policies, it has imposed the principle (ideological and political together) for which certain economic and financial parameters, born as an instrument of control and address the real economic development policies, they were gradually transformed into their objective, having the paradoxical result (and often dramatic in its effects) to bend “real” factors (health, welfare, employment, etc...) in respect of “virtual” and abstract numbers (Lerner, 1943).

There are, of course, some undeniable differences, starting with the fact that the soil is a real and finite resource (ISPRA, 2016), and thereby justifies, in a sense, its protection, other virtual parameters (debt / GDP ratio, deficit / GDP ratio, etc.), in relation to which are imposed artificial limitations and without, by admission of the same promoters, a real scientific basis (Mosler, 1995; Lops, 2014).

The validity of the analogy, however, beyond that of an overturning between instruments and objectives, extends to at least two other aspects:

- the approach used to address the “problem”;
- the results.

In relation to the first point, in both cases it they were imposed rigid constraints of the medium and long term: we can mention, for example, on the one hand the “zero soil consumption” in 2050 imposed by the European Commission in the document “Roadmap to a Resource Efficient Europe” (2011), on the other parameters such as 60% in the debt/GDP ratio, to be reached in a horizon of 20 years, imposed again by European Commission in the “Treaty on Stability, Coordination and Governance” (2012). In both cases the data show a trend toward substantial failure (see the second point mentioned earlier), with progressive deviations from targets that may require sometimes the reformulation of the same (for example, about the soil consumption, even in cases deemed of excellence, such as Germany), sometimes the systematic identification of extraordinary circumstances which would justify the reiteration of exceptions (for example, the periodic need for forms of flexibility with respect to the financial constraints imposed by the European Community Treaties). We can’t now further investigate the European Treaties theme, especially useful for clarifying some conceptual criticality; in relation to the theme of this paper, instead, we can say that identifying quantitative targets of urban and territorial policies does not represent a guarantee of improvement, rather it often leads, paradoxically, to underestimate the profound dynamics that determine the outcomes, with disappointing results overall. It is no coincidence that much of the technical and academic effort has long focused, and it’s still often focusing, on two aspects, one linguistic (definition of the term “consumption”, definition of the term “soil”, etc.), and the other descriptive (constant monitoring of quantities, with sometimes interesting results, but now fairly predictable); substantial deficit appears the other “leg”, the analysis, optical proactive, of the structural causes, which lead to the structural development of certain trends.

To make more effective the approach to a subject as delicate and complex, which essentially

represents the entire planning process, we have to re-establish a more rational balance between the two phases, in line with as suggested by the neo-contract model mentioned above:

- on the one hand, the understanding of the structural causes of the processes, indispensable premise for the construction of proposals that can effectively affect the real dynamics;
- secondly, the provision of more effective tools of knowledge, able to monitor the results achieved and, if necessary, to correct approaches that prove ineffective or even counterproductive.

In this paper we aim to offer a contribution in both directions:

- in the first part, we try to investigate the socio-economic and financial mechanisms that have contributed to the building pressures over time, trying to identify possible containment strategies;
- in the second part, we deepen the potential that databases such as land registry, also interacting with the information of the Real Estate Market Observatory (REMO) of the Revenue Agency, could provide process support of territorial and urban planning and land use, complementing the instruments already available, in the most authentic formulation of “knowledge” of the neo-contractual type.

The underlying objective is to show how a correct definition of the problems and roles, especially in the case of complex phenomena such as the soil consumption, and a balanced relationship between the various stages of the managing and planning process, can represent an essential added value, capable of improving not only the approach but also the results, both in terms of quality and efficiency.

CASE STUDY. THE SOIL: FROM USE TO “CONSUMPTION”

In the history man had to constantly “tame” the ground according to their needs; the birth and development of settlements led to the occupation of increasing portions of territory, with increasingly complex needs.

On the other hand, the non-urbanized land has always been an indispensable complement, a functional factor to well-being of communities; a balanced relationship between these two components has therefore constituted an inseparable element of the settlement dynamics, so not calling for centuries particular reflections on possible systemic criticality in the long term.

Italy, like many other Western Countries, especially downstream of the Second World War, has experienced radical social and economic transformations: urbanization, resulting in soil consumption, has experienced a great development, because of economic transformation from agricultural to industrial place (Bonora, 2012). It was not, contrary to what one might think, or sometimes suggests, of a soil appropriation process driven mainly by “spontaneous” dynamics of unfairness (illegal building, see Romano *et al.*, 2016); It was rather the same urban planning, starting from the 50s and 60s, to propose models, considered of excellence, focused on principles such as low-density housing, the high standards and unrealistic demographic projections, which determined the ideal conditions to promote the maximum extent of urbanization in land use (Campos Venuti, 1987) when it was not perceived as a problem. Among the most influential and significant expressions of this trend we can mention, for example, the Emilia-Romagna school, traditionally one of the most important in Italy; it is no coincidence that, as confirmed by the historical data provided by ISPRA in its report, just the Emilia-Romagna has known the maximum increase in soil consumption between the ‘50s and’ 80s (ISPRA, 2015), moving from ninth to third place among the Italian regions in this special ranking. Already in 1990, one of the greatest Italian

planners, Giovanni Astengo, in the opening address for an honorary degree in Reggio Calabria, admitted “that, in the near future and for a long period of time, the central theme, for a more effective governance of the territory in our country”, would have inevitably become “to replan the already less judiciously planned and managed” (Indovina, 1991).

That was simply because, as mentioned, in that historical phase the land consumption, which was not yet called that, was mostly not perceived as a problem, others were critical (starting by the urgency of providing qualitative and quantitative responses to urbanization phenomena) and to those they addressed the discipline and practice of urban and regional sciences.

There was, on the other hand, a parallel and progressive loss of agricultural land attractiveness, real and potential (Spinelli, Fanfani, 2012), because of both a growing openness to other markets, stronger than an insurmountable competitive advantage on the cost of the work (although often linked to ethically and socially questionable conditions), both of the European Community sector planning policies, that have come to accompany, rather than oppose, the process of disengagement from the agricultural sector in our country (Fabiani, 1995). It is clear that a one-way pressure, in which a prospect to the enhancement “certain” of assets and investments not contrasted no real alternative, could only determine an uncontested and constant trend of urbanization and the resulting in soil sealing, that the data confirms long unequivocally (ISPRA, 2015). The substantially uncontrolled progress of this phenomenon has gradually solicited reflections, then took to become more and more determined position and, finally, reports on the risks related to the persistence of certain behaviors and the need, more and more urgent, in a turnabout.

This was, in a first phase, especially in cultural and scientific-technical environments, where there is the possibility of developing a fairly high level of expertise, but where there isn't the need to translate goals into actions.

Limiting soil sealing: from scientific-cultural requests to legislative proposals

Excluding some exceptions, represented mostly by countries with fairly peculiar territorial and cultural development paths (think of Germany, Sweden, and, in part, Great Britain), the first and most incisive impulses to put in the foreground the issue of soil consumption in legislation have been proposed in Europe at EU level, especially for European Commission initiative.

This is not surprising: the purely guiding role of the European institutions, together with the possibility/obligation to delegate then any Member the burden of identifying the modalities and implementation paths for achieving the objectives, it puts very often them in a favorable condition, allowing them to embrace some battles of principle without having necessarily deepen the implementation criticality (in this sense emblematic of the recent failure - 2014 - the attempt to translate the statements of the Thematic Strategy for Soil Protection - 2006 - in true binding rules at European Community level).

In the specific case, after a series of documents (European Commission, 2002, 2004 and 2006) that progressively introduced the issue in the political and legislative context, a key-step has been reflected at the turn of 2011 and 2012, when two specific and explicit documents were published:

- “Roadmap to a Resource Efficient Europe” (2011), which set a clear objective, already mentioned in the Introduction: zero soil consumption by 2050 (later reiterated in the Seventh Environmental Action Programme, see European Parliament and Council, 2013);
- “Guidelines on best practice to limit, mitigate and compensate soil sealing” (2012), in which, among other things, provides a set of best practices to draw inspiration from to pursue the goal.

The strategy is quite consolidated: set a binding target to the long term and show that, though in

some cases it was possible to achieve it, you can pursue it on a larger scale. Also the limits of this approach are fairly evident: to show some examples in contrast to the general dynamics means to raise exceptions model, exceptions that, by definition, express particular and specific conditions (see Lucchese, Santarelli, 2014).

Without adequately investigate the root causes that determine the behaviors prevalent as “correct”, often also differentiated according to the reference territorial context, the definition of objectives, as binding, it’s generally ineffective. It is no coincidence, indeed, that the time horizon of binding commitments results, on these occasions, always large enough to sound reassuring, in some cases perhaps even able to negate a sense of responsibility, for the ruling classes to sign it, leaving critical issues in the hands of who, in the future, will have to implement them concretely. The experience of several European Countries, even in cases considered more virtuous (in particular, as mentioned, and as will be seen later, in the German case), confirms that the strategy of placing quotas, “numbers” as a long-term objective can hardly represent in itself a guarantee of achieving the commitments, despite it may help to revive the issue on the political agenda.

In Italy’s case, accused of being enough back on the topic, already at the beginning of the current legislature were presented several bills that, although with some differences, placed themselves the objective of containing the soil sealing processes (Santarelli, Lucchese, 2013). We can mention:

- Law proposal no. 70 “Standards for the soil use containment and urban regeneration”, 15.3.2013, rapporteur E. Realacci;
- Law proposal no. 948 “Framework Law concerning the development of agricultural areas and the soil consumption containment”, signed by the then Minister Catania (15/05/2013);
- Law proposal “Rules for the containment and reduction of land consumption”, promoted by the Italian WWF (2013);
- Law proposal “Rules for the block of land use and protection of the landscape,” promoted by “Movimento 5 Stelle” (24/05/2013);
- Law proposal “Rules on development of agricultural areas and containment of soil consumption”, signed by Bordo e Palazzotto (SEL), no. 902 of 08/05/2013.

DDL “Soil consumption containment and soil built reuse”, proposed by the government then headed by Enrico Letta (03/02/2014). Last May the latter measure, which has also absorbed some of the other proposals mentioned (no. 902 and no. 948), has finally completed its process in the first branch of Parliament; it’s now time to see if the law will be finally approved or if, as happens routinely for decades for all legislative measures designed to reform deeply the territorial government, will emerge the usual obstacles such as to frustrate this latest attempt.

The interests at stake: a brief overview

However, even if there is a good “sector-specific” law, the benefits would be likely limited.

The basic problem, in fact, is that the incisiveness of policies on issues such as soil consumption depends primarily on one factor: the ability to coalition interests involved. This is the real shortcoming in the past and present, both at the European

Only by properly setting this step we can make effective the specific legislative instruments, as well as those of knowledge and monitoring, which will be the subject of the second part of this paper.

Costs and benefits

An argument on the legitimate interests that want the soil waterproofing in our country is that urbanization, even before and even more edification, represented in Italy one of the safest forms and

guaranteed value creation, thus investment. It has been estimated that, in our country, the creation of value in the form of real income passed, in the moments of greatest expansion, the 30% of GDP (Bonora, 2013); between 1995 and 2010, the real estate investment in major urban areas saw 9% higher yields (and in medium-sized cities 8%), the largest ever, when you consider that in the same period the gold was amounted to 8%, government bonds at 4,4%, equities at 2,8% (Bonora, 2013). A recent publication of the Bank of Italy (Cannari, D'Alessio, Vecchi, 2016) provides an interesting quantification of this dynamic, in terms of the historical series: the study shows how, starting from the 1970s, the real price of housing has undergone a progressive and constant growth, year after year (regardless of the fluctuations related to the real estate cycle), such as to result in 2012 more than 2,5 times higher compared to the 1950s datum.

The same study also shows how more than 2/3 of this increase is due to the contribution, on the price, of buildable areas; it was, therefore, a real spatial enhancement process, benefiting property owners, thus a large part of Italian citizens, given the high percentage of homeowners that structurally characterizes our country.

By choosing another point of view, then, what we use to define today as “consumption” of soil, with a negative connotation linked to the long-term impacts on the environment and landscape, it could also be considered as a “promotion” of soil, with a positive sense connected to the creation of wealth, which has benefited a significant part of the population for decades (Romano, 2013).

Certainly you can see how in the long-term “costs” of environmental and landscape tend inevitably to prevail and to make negligible the immediate benefits of an economic nature related to the compensation; we have to consider, however, as in the practical assessment of the impact of the costs and benefits it is decisive the “real perception” that they have the actors involved, and in this sense the weight of the two perspectives tend to tip over, according to the famous maxim of the economist J.M. Keynes, for which “in the long run we’re all dead” (Keynes, 1923).

This also can explain the exercise of translating “soil consumption” in economic costs (the “hidden costs”, as defined by the European Commission; see European Environmental Agency, 2006), thus trying to realize more immediately appreciable numbers regarding the long-term benefits that might otherwise appear evanescent to certain stakeholders; ISPRA, for example, in its Reports (particularly that of 2016) estimated systematically, in some detail, both the damage from soil sealing (hydrogeological, no water infiltration, absence of pollinating insects, temperature increase, etc...), and the alleged missed benefits (starting from the erased agricultural production).

Be able to translate these conveniences “theoretical” for convenience “concrete” represents, in perspective, the real challenge that can make realistic policy objectives who have long been trying to put in place, with results disappointing.

The origin of settlement pressure: from savings to private debt

It is therefore clear how the expansion of urbanized land base there has been a multifaceted network of interests, primarily economic, which led to a widespread consensus for policies of promotion of soil transformation or even tolerance for any phenomena of illegal construction.

One of the main drivers of this process has been shown, at least for a first long period, from the top level of savings of Italian families: the net rate of savings, in the ‘70s and early ‘90s, stably exceeded 20%, sometimes even 25%, making it the highest in the world (OECD data). Regardless, therefore, population dynamics, a question of widespread investment (especially, and understandably, born in the period of great inflation of the ‘70s) was the basis for the steady growth of settlement pressure. In the mid-late 90’s it was then registered a profound change in the context, which has resulted in the real estate sector, in the beginning of the broadest and

most explosive phase of expansion ever known from our market (Real Estate Market Observatory, 2016b). The drastic decline in the household savings rate (dropped below 10% in 2000 and then almost always down, until you get below 5% at the end of the decade) was offset from the beginning of a very favorable phase in terms of credit granting, also facilitated by low interest rates guaranteed by entry into the euro (the Bank of Italy, 2013); this is the moment in which it began, in our country, a phase of progressive private household debt growth, which almost nearly doubled, in relation to the GDP, in just over a decade (OECD and EUROSTAT data).

This mechanism produces a double pressure on the real estate market and on the demand of urbanization:

- families tend to reinforce, to the detriment of the financial component, the real component of their wealth, which at the end of the decade reached nearly 2/3 of the total (Bank of Italy, 2015), and that is largely represented by real estate property (about 85% of total real assets at end-2010);
- credit expansion (Bank of Italy, 2013 and 2015), causes, inevitably, a corresponding increase in the demand for collateral, usually represented by real estate property itself.

On the one hand, therefore, it is the persistence of a real investment interest; on the other, it makes its way, more and more strong, a financial interest, which then gradually increased their weight, both relative and absolute (ANCE, 2011).

But what macroeconomic mechanism, certainly sustained by facilitated credit, has strengthened, in this new phase (late 90s), the centrality of the real estate sector in the economic system, contributing to justify such a significant expansion, until the crisis of 2007? A major reasons may be definitely in the effects of monetary union; if fact are introduced, in a system that makes open and flexible, in a sense, its mission, elements of rigidity, it is inevitable to expect repercussions in the medium to long term.

In particular, when a considerable and decisive part of an open and widely competitive market such as the European Common was inhibited by physiological monetary exchange valve, remaining at the same time structural differences between the economies involved, inevitably the bases are placed for the development of asymmetries; specifically, the persistence of inflation differentials gradually ended up penalizing, in sectors exposed to foreign competition, those who had the highest inflation rates. In other words, it ended up having a weak currency for some and too strong for others (Bagnai, 2012; Stiglitz, 2016).

At the latter (to which also belongs to Italy) the progressive reduction of competitiveness in sectors such as manufacturing and industrial (with consequent impact on the trade balance) it has led to direct the economy towards sectors protected from foreign competition, particularly services and, of course, real estate (Attali *et al.*, 2012; Dastoli, 2015; Bagnai, 2016).

They have influenced this vicious circle, as mentioned above, even the low interest rates guaranteed by monetary union: they are so much been subsidized consumption (increasingly import), as investments, starting as mentioned, from real estate (Bank of Italy, 2013), with the effect of increasing private indebtedness.

As we see, then, both economic mechanisms and, with increasing impact, financial matrix mechanisms, given the conditions described above and still valid in countries like Italy, have contributed to increase the expectations and the pressure on the real estate sector, producing a strong pressure on urbanization of soils; all indicators confirm this trend, by the explosion of sales to higher prices, by the continuing growth of building permits and investments in the construction industry (ISTAT and ANCE data) to the gradual increase of the soil consumption (well documented by ISPRA).

In these cases, however, it may suffice a destabilizing event, also external, to expose the intrinsic fragility and the weaknesses of the underlying model system; this event occurred in 2007 (the scandal of the U.S. “subprime” mortgages) and from there began a real collapse of the market in our country, with a trade volume almost halved in 6 years to return to the levels 80s (Real Estate Market Observatory, 2016b), and a drop in prices that is still struggling to stop (see IPAB index, ISTAT database).

Inevitably the post 2007 crisis involved the entire economic system, already weakened by the dynamics described above. If we analyze the data for other countries in which the euro has been a “strong” currency, we can see substantially similar dynamics to those just described in reference to Italy, often even with amplification coefficients inversely proportional to the overall soundness the economic system, when compared with that Italian; think, for example, to Spain, characterized in expansion from an uncontrolled and, to the long, distortive increase supply for construction, where prices, more than quadrupled in the decade pre-2007, have then halved in a short time.

This mechanism is confirmed by the data relating to those countries for which, however, the euro represented a coin “weak” compared to economic fundamentals. If we examine the case par excellence, Germany, a favorable inflation differential (Krugman, 1998; Bagnai, 2012), sheltered from the corrective factor represented by the monetary exchange, has produced a progressive competitive advantage in the sectors “exposed” to the international competition, to the detriment of competitors especially within the euro area.

The effect was, therefore, on the one hand a steady growth of exports, with a trade balance surplus consistently above the same limits theoretically imposed by the European treaties, on the other a stable real estate market, both in terms of prices, remained largely unchanged, and investment, that in the period 1998-2007 have been even a contraction of 12.8%, compared to + 82.2% in Ireland, by + 73.4% in Spain, by + 69.9% in Greece and + 29.4% in Italy (Bonora, 2012).

Often comparative studies about changes in land use and the effectiveness of its enforcement policies tend to relate the virtuosity of the German case with the particular vision of the legislative measures adopted and perseverance in pursuing ambitious targets, as proved not always realistic (CRCS, 2010; Zamboni, 2013); instead they underestimate, or even ignore, the key factor that has allowed certain approaches and results. It was and still is represented by a convergence of favorable conditions and interests (some studies in part have recognized it: Frisch, 2005), induced by the aforementioned macroeconomic preconditions, which enable the German economy to enhance the rated sectors export, thus reducing possible pressure on the real estate industry.

It is, quite obviously, the conditions exactly opposite to those developed in Italy and in other countries of the “Southern Europe” and which, in some way, also benefited from Germany to support its “virtuous” model; this is the reason why, remaining the existing economic and political order, invitations to learn from the German model are only a sterile and contradictory exercise in rhetoric.

The financialization process

The data provided by ISPRA in its annual Reports concerning Italy show how, despite the sharp decline in the real estate market that occurred after 2007, the soil subject to sealing operations continued to grow strongly, albeit recently a little less marked (ISPRA, 2016).

It could appear surprising, if we start from the reasonable assumption that the housing market represents one of the most significant elements of pressure on the expansive dynamics of the urban perimeters.

We can search for a possible explanation in the contextual, progressive fragmentation of families and in the increase of the additional demand resulting from migration; it certainly seems reasonable

that these phenomena may have had some effect, but long demographic trends are no longer a factor capable of justifying itself the extent of urban and territorial transformations. In fact recent trends may be explained again by analyzing the credit industry, this time from a “higher” level: we refer to politics of “quantitative easing” implemented by the ECB, finalized at providing the banking system with currency at low cost, encouraging, at the same time, the use through forms of “taxation” of deposits in the Central Bank.

However, the socio-economic context to which this potential money would be destined presents the same imbalances described above, with reference to recent years, and the same structural problems, if anything increasing further over time: on the one hand, the intrinsic weaknesses of productive and industrial system (penalized by the accumulated deficit over time without removing their causes) and of a growing part of the family budget (penalized by wage restraint policies designed precisely to cover this deficit), on the other a sector, the real estate, which seems to have overcome the worst phase (as shown by increase in sales and price stabilization) and that seems to come at that phase of the property cycle considered the most propitious for investments (Jansenn, Kruijt, Needham, 1994). We must remember that, normally, the banking sector may grant loans regardless of the presence of sufficient hedging reserves, reserves that can then easily obtain (Mosler, 1995); the true condition for the granting of a bank loan is the expected profitability.

However, at this phase, defined not by chance “unconventional”, the banking sector is previously provided considerable money supply in excess, in order to hold that it “pays” an interest; however, such as the data confirm, this interest is preferable to the risks that would involve lending to households and businesses (hence the failure up to now of the operation, if understood in its original aim of reactivating the real economy, consumption and inflation). The real estate market can therefore once again be, in view of its favorable outlook (Real Estate Market Observatory, 2016a), the more attractive “safety valve” to invest this excess money; recent legislative facilitation measures in the recovery of loans secured by real estate (see, for example, the implementation of European Directive 17/2014) represent a further element of encouragement, reducing the “business risk” of the creditor. Similarly, the attractiveness of real estate income could increase also for small and large private investors, who have survived the twenty-year phase of erosion described above, given the inconsistency and the growing uncertainty and instability that are characterizing financial investments, at each level of risk, as a result both of the aforementioned policies of the ECB (rates close to zero or even negative) and of the discussed regulations of the sector (such as the so-called “bail in”). Similarly, even small and large private investors, survivors of the twenty-year phase previously described erosion, could be further attracted to real estate income, given the inconsistency and the growing uncertainty and instability of the financial investments, at each level of risk, as a result both of the ECB’s policies mentioned (rates close to zero or even negative) and of controversial sector regulations (see, for example, the so-called “bail-in”).

One last thing to consider, finally, is the low inflation regime, or even deflation, that the economic policies of recent decades have pursued. A medium-high level of inflation, in fact, is usually a sign of a certain redistribution between capital and labor, as to sustain productivity and aggregate demand, starting with the most dynamic sectors of the economy; on the contrary, a stable or negative dynamics of prices benefit the “rentier”, albeit with lower margins of sustainability in the medium to long term, thus increasing the attractiveness of property values in the investment (Bagnai, 2014). These are, therefore, the reasons for which the current real estate market recovery should not necessarily be interpreted as the beginning of a virtuous phase of the economic system as a whole; on the contrary, while the “original sin” of the current structural imbalances remain, they could easily be the symptom of the recurrence of destabilizing dynamics in the medium-long term (financialization, private debt, imbalances in the distribution of wealth). These dynamics could produce further

pressure on urbanization processes, a factor that could certainly lead, as long hope sector studies, to the development of the operations of “urban regeneration” and redesign of existing urban areas, but that, in particular where continued to result from interests indifferent to “good governance” of the territory, may present a serious risk to benefit the gains of land rents. Often, however, it is not the physical soil consumption to entice lenders and creditors, as that “on paper”, which allows you to hypothecate areas to be allocated to future transformations, capitalizing immediately ground rent and returning to better times the risk connected to the realization of projects and buildings; we can define this a “virtual” soil consumption, difficult to monitor, but the impact of which could be, in the long term, even greater than the real one (Lucchese, Santarelli, 2014). The most singular paradox that derives from all the above, finally, is that, if all of the current imbalances of the system remain, starting from the “competitive” advantageous conditions of the real estate sector compared to other more dynamic sectors of the economy, the strong risk is once again finding oneself faced with the dilemma of having to choose between a rational use of the soil and the prospects of economic growth, however fragile the growth may be.

The increasingly widespread mix of equalization planning models, based on flexible building indices not always easy to interpret, and urban contracted tools, able to make “special” any project or intervention, represent a very insidious plot, in which the strong subjects who sit at the planning table can easily find the ideal conditions to impose their point of view and interests (Urban, 2007); to protect a correct land use, in fact, it is necessarily called the public subject, the only possible stakeholder to do so. Unfortunately, the public subject is increasingly also the weakest and penalized subject: for example, try to limit the dependence of local governments from tax revenues related to new urbanization may take, as shown for example in France (L. 586/99, which promoted, under certain conditions, the state compensation funds for municipalities in difficulty; see. Charmes, 2007), public financial efforts now likely to be inconsistent, in our country, with current spending constraints imposed by the European Union.

The most peculiar paradox, finally, is that, remaining current system imbalances, starting from preferential conditions “artificial” in the real estate sector compared to other more dynamic sectors of the economy, the strong risk of being once again faced with the choice between a rational land use and prospects for, though fragile, economic growth.

Outlook

The proposed framework, to date very likely, depends however to a projection by the evolution of the many variables involved, especially those of a political and economic, with dynamic also exposed to significant and increasing degree of uncertainty. The core concept, however, remains that initially expressed: to think to effectively address the problem of land use, we can't ignore all the conveniences and interests that historical, economic and social context determine.

The physical transformations in fact represent nothing more than the result of the complex framework of factors arising from the relationships between the actors involved.

Only if interpreted in this sense, a more accurate and detailed picture of the territory, able to detect the formal and, as far as possible, substantial developments, can become a very important tool in the definition and management of policies; otherwise it would be destined to the marginal role of “witness” of failures (as is currently the situation).

So we can draw two important conclusions:

- to combat the soil consumption we have to understand the mechanisms that determine it and of which we previously have tried to provide some insights. This is an operation which is related to

the political, which requires discretionary and incisive choices, with implications that are even more complex than those associated with conventional planning processes;

- to build an effective knowledge and monitoring system represents an indispensable element in order to achieve the above objective, certainly not enough, but a necessary step.

It is important that these two aspects are developed in parallel and coordinated, thus creating an effective interconnection between knowledge, policies and monitoring; so far this has not happened, as the results confirm, and the approach shown by the town planning has partly contributed to these outcomes. By properly setting the strategy, however, the tools of knowledge and monitoring of increase territorial transformations surely its effectiveness and incisiveness, avoiding to continue to confine in a cloying self niche.

THE ROLE OF KNOWLEDGE

Taking up the question posed in the Introduction, the role of “knowledge” in a mature and effective land management process is therefore twofold:

- accompanying the articulation of the decision-making phases, by providing the necessary quantitative and qualitative data;
- monitoring the results of policies, to appraise the results and to promptly correct the defects.

In this sense the urban planning and land management discipline is experiencing an interesting evolution.

If we take as reference the theme of soil use/consumption which, as seen, is not only a “cyclical” priority, but a synthesis of contemporary disciplinary critical issues, the steps forward, especially recent ones, are very significant.

In this context ISPRA plays definitely a central role, also following the recent establishment of the National System for Environmental Protection (SNPA), of which it is a member like the Environmental Protection Agency, Regions and Autonomous Provinces.

The main merit of ISPRA has been to making unitary and organic detection of a phenomenon that, even earlier, had been the subject of several very interesting studies.

Among them we can mention:

- the Corine Land Cover 2006 project, made in Italy by APAT, former ISPRA (ISPRA, 2010);
- the analysis entitled “ The numbers of the aggression to the landscape“, developed by Vittorio Emiliani at the conference “Italian landscape attacked: what should be done?” (Emiliani, 2007);
- the dossier on soil consumption realized by the WWF in 2009;
- the annual Report 2009 of the Italian Geographical Society (Quaini, 2009);
- the study of Paolo Berdini related to soil consumption in Italy in the period 1995-2006 (Berdini, 2009);
- the Legambiente report “Another house?”, concerning, in particular, the impact due to the construction of residential buildings (2010);
- the dossier “ Stolen land. Voyage in a disappearing Italy“, realized jointly by FAI and WWF in 2012.

We have to remember also the activities of the Centre for Research on Soil Consumption (consumosuolo.org), which began as the National Observatory on Soil Consumption, active since 2009 and founded by the National Institute of Urban Planning (INU), Legambiente Non-profit Organisation and the Department of Architecture and Planning of the Polytechnic of Milan, focusing especially on the definition of criteria for detection and quantification of consumption; especially focused on the definition of criteria for detection and quantification of consumption; among other things, it develops, on a regular basis, studies and reports, with the presentation of national data, specific focus on case studies and insights on issues from time to time deemed current.

From 2014, however, with annual reports on soil consumption edited by ISPRA, the detection of the phenomenon has acquired a systemic character necessary to make it an instrument capable of monitoring, as well as to photograph “one-off”, the changes affecting the territory. This acquisition activity and data processing has also allowed us to reconstruct the evolution of land use in Italy after World War II, with the aid of historical maps; these surveys are based mainly on the instrument of the photo-interpretation, or on increasingly sophisticated analysis of orthophotos reliefs, aimed at combining the aerial and satellite images with the relative soil use. In this sense we could talk of a “deductive” method of acquisition and restitution of data: from the effects impressed on the images, we can trace the underlying phenomena (natural and anthropic dynamics), with techniques that guarantee a growing degree of detail and reliability² (ISPRA, 2016). In operational terms this process of knowledge is reflected in the provision of more and more complex instruments. In June 2016, for example, it was presented a new GIS platform, called “Soil Monitor” (www.soilmonitor.it), able to evaluate the land use nationwide and carried out with the collaboration, among others, of National Institute of Urban Planning INU). In summary, this is an interactive map that allows you to select, at the national level, any portion of the territory and to gain a wealth of information, from the impacts produced by the use soil of the past and present, from the economic, environment and urban point of view, to the possible impact of any future interventions. The objective is to support, once fully operational, municipalities and planners in the design and monitoring of its policies, also in implementation of the provisions of the aforementioned draft framework law on the sustainable management of land, being discussed in Parliament.

Cadastral and Real Estate Market Observatory databases: from “deductive” knowledge to “inductive” knowledge

In this framework, of which we have seen the most important examples, the Cadastral and Real Estate Market Observatory databases, also thanks to the constant process of qualitative and quantitative improvement of the information, could represent a powerful instrument to support planning choices, both in terms of knowledge and monitoring.

In fact, Cadastral and Real Estate Market Observatory databases, could represent important sources of information on urban system to integrate the traditional cognitive instruments of planning. The main specificity of these data banks, therefore of any “cognitive frameworks” that might ensue, is represented by the path of the construction of knowledge: from the object to the set, not the other way around.

As mentioned, the knowledge of the traditional cards follow a logic that is basically “deductive”: it detects a context, within it are identified items deemed to be of interest, then you characterize them as much as possible, depending on the objectives. This approach has the main advantage of ensuring a certain degree of consistency to the process of detection and, above all, the updating of information. On the contrary, the cadastral data arise, by definition, from the “object”, according to a method that we could define “inductive”; it is from the composition of geo-referenced information relating to individual objects that we obtain the picture which can become an actual “cognitive framework”.

The main limit unfortunately resides in the nature of the original data; since they come from administrative data banks, in fact, they are not originally structured according to ordered and integrated “second level” processing, therefore they very often contain information which is unusable or incomplete in the framework previously illustrated.

² As we mentioned, in the previous section, the zone is the minimum sub-municipal aggregate unit, according to characters of homogeneity of the urban and socio-economic type (Real Estate Market Observatory 2008).

In this sense, as mentioned, significant steps forward have been made (and are still being made), although there is still considerable room for improvement. As mentioned, this data have high potentiality principally for two reasons:

- the “auto-update” occurs almost in real time;
- the ability to start from real dynamics (physical transformations, purchases of goods, etc...), without having to search through the effects of deriving interpretation.

It therefore seems reasonable to insist on a course which promises very interesting developments; however, some results were already in place and, in the following paragraphs, we try to account for them, albeit in a necessarily partial and synthetic.

From parameters to indexes

In the tables that follow, we report some parameters and some indicators, constructed through opportune combinations of the parameters, derived from cadastral data banks (the data refer to 31/12/2015).

The analysis covers only the municipalities (7,510 from a total of 8,101) which the information are available from the Real Estate Market Observatory database. In this data bank, the zone is the minimum sub-municipal aggregate unit, according to characters of homogeneity of the urban and socio-economic type (Real Estate Market Observatory 2008).

In Table 1, for each Region, we report the percentage of the municipalities analyzed. We have excluded Trentino Alto Adige because the cadastre is managed by the relevant autonomous provinces and the Valle d’Aosta, because, at the time of processing, we still not have an adequate quantity of data.

Region*	ABRUZZO	% municipalities analysed**	100%
	BASILICATA		100%
	CALABRIA		96%
	CAMPANIA		99%
	EMILIA-ROMAGNA		97%
	FRIULI-VENEZIA GIULIA		100%
	LAZIO		99%
	LIGURIA		100%
	LOMBARDIA		97%
	MARCHE		99%
	MOLISE		100%
	PIEMONTE		97%
	PUGLIA		100%
	SARDEGNA		92%
	SICILIA		89%
	TOSCANA		98%
	TRENTINO ALTO ADIGE		nd
	UMBRIA		100%
	VALLE D’AOSTA		nd
VENETO	100%		
TOTAL			92%

Table 1 Percentage of municipalities analyzed by region

* Data are not available for Trentino Alto Adige and Valle d’Aosta

** Percentage of municipalities of which the following variables analysed are considered

In Table 2 we present, as mentioned, the parameters and indicators, constructed in order to describe some aspects of soil use related to the processes of urbanization.

In the first two columns, we report data referring respectively to the land area of municipality analyzed and the population density (population for km²). In the last two columns, we report an indicator of density and an indicator of intensity as developed in a previous work (Festa, Mongelli, Reggiani, 2013).

Region	Land area of the municipalities analysed - Km ²	Population density Pop / Km ²	Density construction Buildable area / Tot. area	Building intensity no. urban real estate units/no. buildings
ABRUZZO	10,797	123	4.4%	2.8
BASILICATA	9,994	58	3.2%	2.1
CALABRIA	15,050	111	4.6%	2.4
CAMPANIA	13,584	429	7.5%	3.4
EMILIA-ROMAGNA	22,016	169	7.7%	3.5
FRIULI-VENEZIA GIULIA	7,852	156	7.4%	2.4
LAZIO	16,404	334	9.4%	3.9
LIGURIA	5,430	292	5.7%	3.6
LOMBARDIA	23,133	332	11.8%	4.0
MARCHE	9,660	162	6.7%	2.9
MOLISE	4,448	70	3.1%	2.1
PIEMONTE	24,492	176	7.0%	2.8
PUGLIA	19,370	209	7.4%	2.9
SARDEGNA	21,411	42	3.5%	1.9
SICILIA	24,402	189	5.2%	2.3
TOSCANA	22,945	148	6.8%	2.8
UMBRIA	8,453	106	7.6%	2.5
VENETO	18,372	267	11.3%	3.2
TOTAL	277,810	194	7.0%	3.0

Table 2 Main indicators of use of the area by region

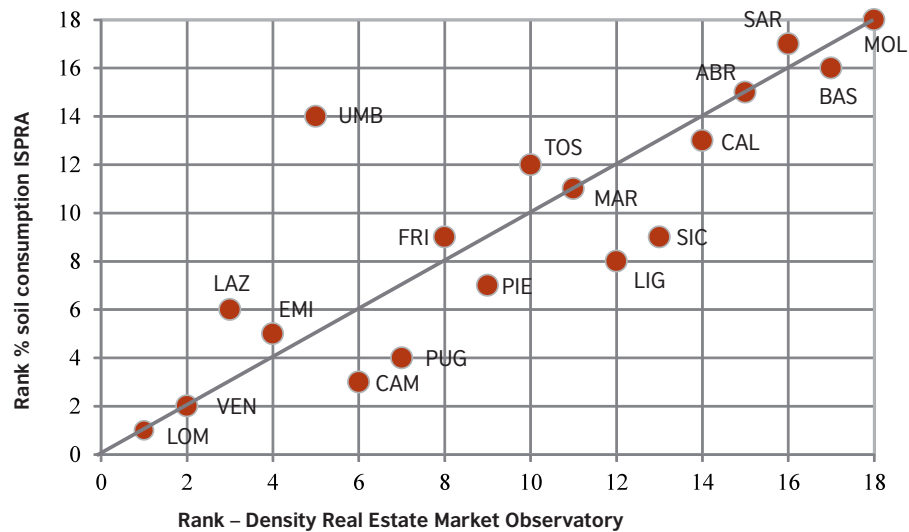


Figure 1 Comparison of indicator of density and % of soil consumption ISPRA
Sources: based on Real Estate Market Observatory and ISPRA data

From a computational point of view the density indicator is the ratio between the surface area of the parcels with buildings and the difference between the total surface area of the particles and the surface area of the waters, while the indicator of intensity is calculated as the ratio between the number of real estate units and the number of buildings built in the territory surveyed in the cadastral records.

The first ratio is bi-dimensional because it is a ratio between two surface in map, it is able to provide a quantification of the process of “sealing” (by urbanization) of the soil; furthermore we underline that compared to other surveying (e.g.: ISPRA), here the “sealed” area comprises the entire cadastral parcel on which the construction is built, it could therefore happen that it also contains portions of unbuilt territory that, strictly speaking, would be “not consumed” soil. On the basis of the second ratio, instead, we have information on the “vertical” development of the settlements.

To confirm the degree of reliability of our study on soil consumption, in the graph in Figure 1 we compare the results obtained, in terms of rank of each region, with our density indicator and those published by ISPRA with the previously defined “deductive” type method (see ISPRA, 2015). The outcome is generally reassuring, except the region of Umbria which seems to depart significantly from the reference line with our indicator that seems to overestimate the degree of soil sealing. In the first place there’s, probably, a statistical reason (since the data is very close, the significance of the rank can easily penalize it), but also to the average size of the parcels built in that region (greater than the national one and to most other regions) and by reasons related to the settlement structure, characterized by a strong and distinctive integration between building and green spaces, between “full” and “empty”.

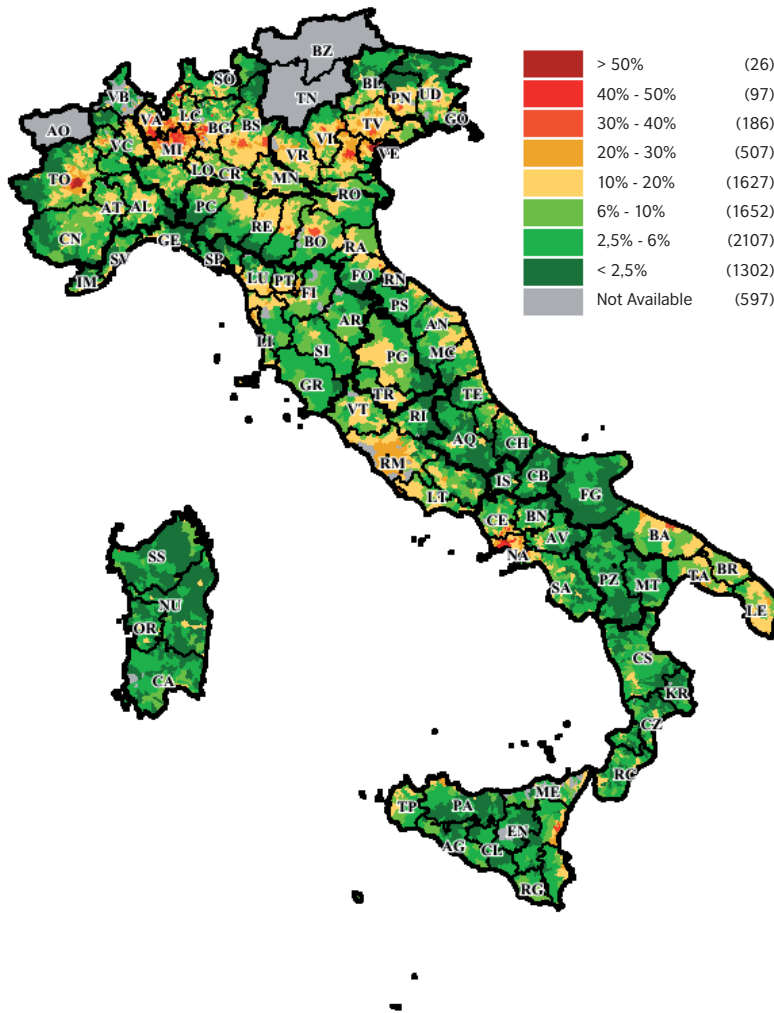


Figure 2 Building Density by municipality

In Figure 2 we show the density indicator by municipalities and we can note that more than two thirds of the municipalities have values lower than 10%, while only a little more than one tenth exceeds 20%. However, these results, apparently comforting,

However, these results apparently good, are due to the morphology of the Italian territory. In fact, Italy has a major presence in mountainous and hilly areas that represent a “natural” limit to urbanization. To take into account this problem, ISPRA in its analysis exclude the areas with altitudes over 600 meters and the areas with a slope greater than 10% (ISPRA, 2015).

Starting from Figure 3, the analysis proceeds by comparing the two indicators, Density and Intensity and their relationship, *i.e.* horizontal development and vertical development of the settlements.

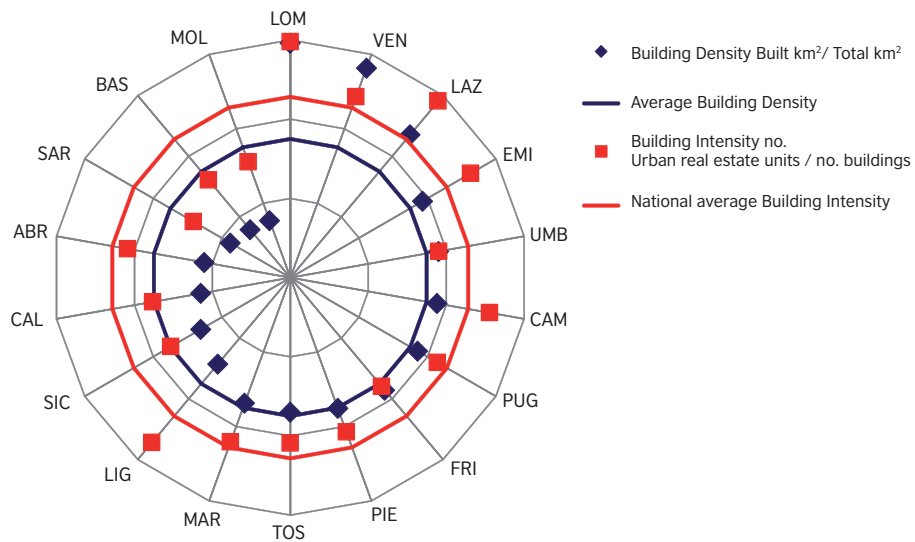


Figure 3 Indicators of density and intensity of soil use by region

The first graph (Figure 3) shows how in both cases the indicators, on a regional scale, show the strong polarization which we have mentioned previously, with few regions having values higher than the average. Moving to the provincial scale, in Figure 4 are shown, in a scatter plot, the values of the two indicators. The black lines are the average value of each variable (7.0% for density and 3.0% for intensity) and they permit to divide the graph into quadrants that allows an easier interpretation of the data. Thus, we have areas that have a high exploitation of the territory of high intensity (HIGH - HIGH), areas of low urbanization and low intensity (LOW - LOW) and areas that are located in the intermediate situations (HIGH - LOW and LOW - HIGH).

In the specific case, there is the confirmation of the trend described above: the "LOW - HIGH" quadrant (substantial volumes concentrated on limited portions of the territory), that is, the settlement model toward which the urban planning is pushing to counteract soil consumption, turns out to be much less widespread, while the "LOW - LOW" quadrant has the greatest concentration of provinces (also due to the effect of the characteristics of our territory previously cited).

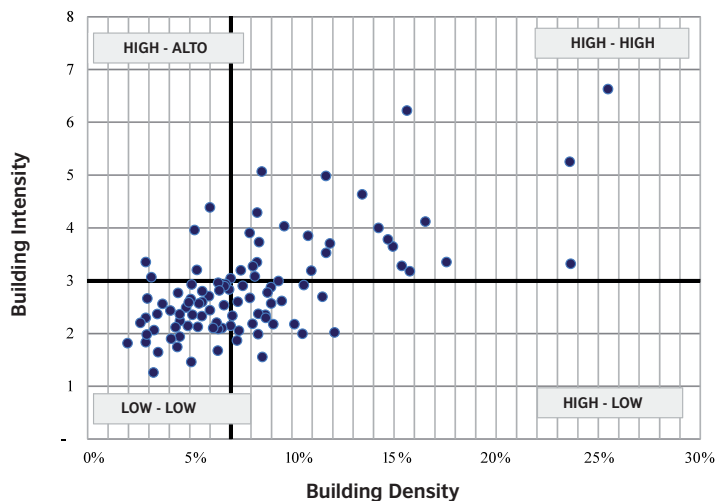


Figure 4 Indicators of density and intensity of soil use by province

In Figure 5 we show in map the cluster of Italian provinces as defined in Figure 4 (HIGH - HIGH, LOW - LOW, HIGH - LOW and LOW - HIGH). We highlight a concentration of the highest values throughout the foothills of the Alps, in the area between Emilia-Romagna and Toscana, in the central area (Lazio, Umbria, Marche and the province of Pescara) and, in the south, in Campania and Puglia.

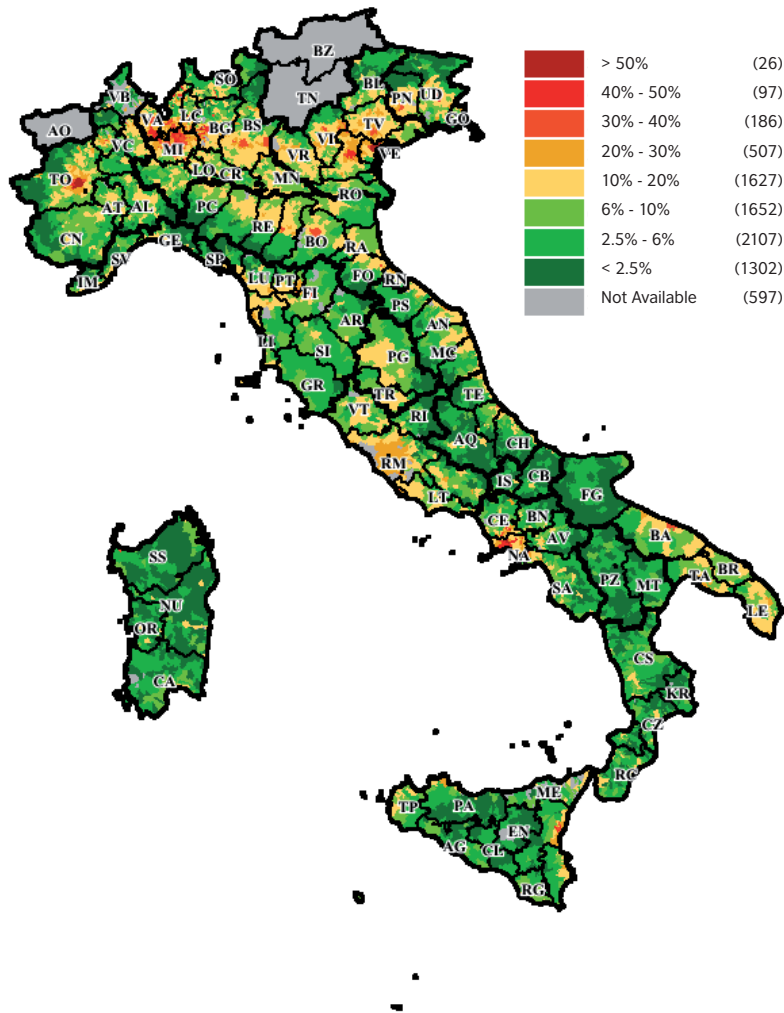


Figura 5 Cluster of the provinces by the density and intensity levels

In a similar way, in Figure 6 we report the same clusters for the municipalities. At this territorial level further territorial divisions of the settlement processes emerge, that the previous scale did not allow us to take into consideration: among these, certainly emphasizing the obvious, substantial sealing of the Adriatic coastline, from Emilia-Romagna to Abruzzo, which confirms the trend toward the establishment of a real linear city (Properzi, Di Ludovico, 2012).

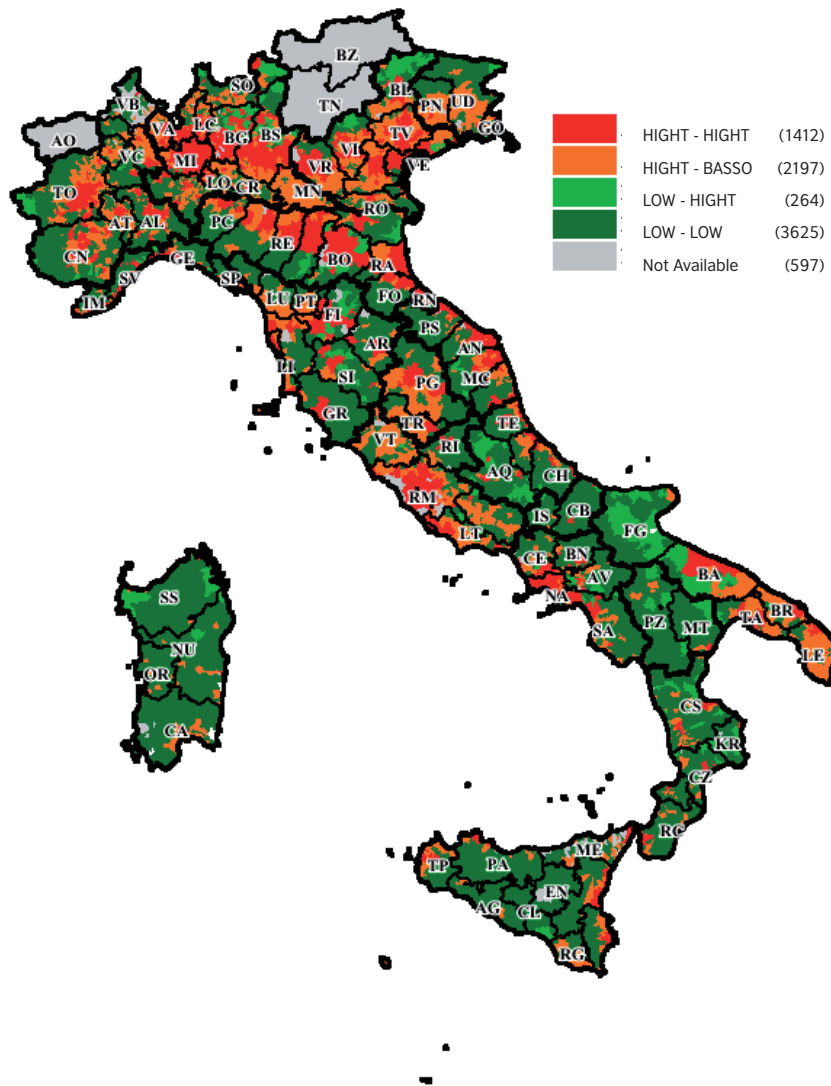


Figure 6 Cluster of the municipalities by the density and intensity levels

We continue the exercise at sub-municipality level and in Figure 7 we represent for the case study of Rome the data by taking as reference the urban macro-areas. These latter are appropriate aggregations of zones³ having characters of homogeneity in terms of characteristics of the real estate market, created by the Observatory in order to improve the reading of the trends of the market itself. Looking the map there is a substantially concentric trend with lower value of intensity index compared to those of the semi-central and peripheral crowns. Furthermore, we underline two main directions of development, one to the east and one to the south-west.

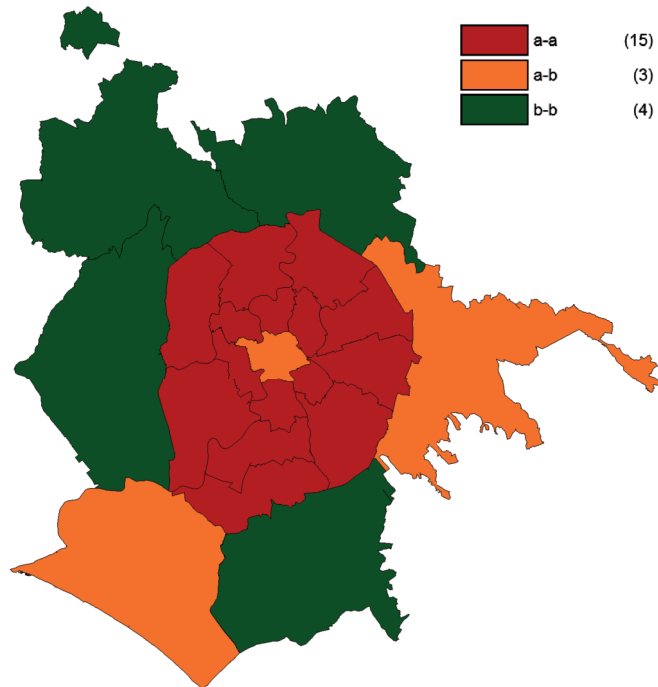


Figure 7 Building Density and Intensity in the urban macro-areas of the municipality of Rome

³ As we mentioned, in the previous section, the zone is the minimum sub-municipal aggregate unit, according to characters of homogeneity of the urban and socio-economic type (Real Estate Market Observatory 2008).

Finally, always with reference to the Municipality of Rome, the graph in Figure 8 according the analysis already seen in Figure 4, shows the two indicators for each zone. In some cases reprocessing of data has been necessary, in order to take into account some inconsistencies related to the presence of significant water areas (e.g.: the Tiber River).

Most of the high density areas (>90%) thus belong to the historical center, as is moreover predictable, considering the high degree of soil sealing in that area of the city; as seen in Figure 7, instead, the highest levels of intensity in the exploitation of the soil are recorded within the peripheral band, with urban planning implications that would evidently require closer investigation.

Considering the approximations that exercises of this type inevitably involve, however, there is confirmation of the high potential margins of any policies for urban restructuring aimed at a concentration of building volumes, with possible limitation of ground occupation at the same time.

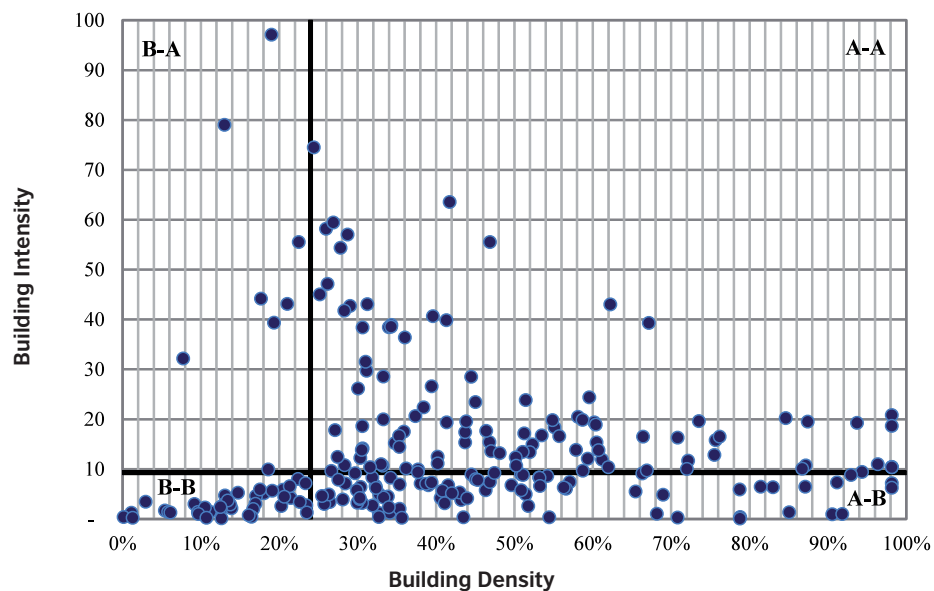


Figure 8 Indicators of density and intensity of land use by Real Estate Market Observatory zone (municipality of Rome)

Those illustrated up until now aim at being examples of possible developments which may arise from an analysis, properly oriented, of the cadastral data at the various territorial scales. According to the needs of the urban planner, it is therefore possible to build, as was said when introducing the topic, real cognitive frameworks, capable of effectively interpreting some of the dynamics of use and transformation of the soil.

Integration between cadastral data and "economic" data

As previously introduced, as final theme, we consider useful to illustrate the possible integration between cadastral data banks and "economic" information processed by the Real Estate Market Observatory.

In Table 3 we show an application always with reference to the Municipality of Rome and starting from the urban macro-areas (see Nota Territoriale Roma II semestre 2015).

Urban Macro-areas	% Urban Real Estate Limits estimated	% Land rent Income estimated	Overall value € mil.	GDP and built value €/m ²	Buildable Land Index Sup Buildings* / Sup GDP and Built
Historical Centre	85%	53%	56,455	6,939	1.3
Semicentral Appia - Tuscolana	86%	73%	22,635	6,776	2.0
Semicentral Aurelia - Gianicolense	88%	75%	28,775	5,682	1.6
Semicentral Ostiense - Navigatori	88%	62%	17,722	4,310	1.4
Semicentral Parioli - Flaminio	87%	63%	23,527	5,372	1.0
Semicentral Prati - Trionfale	88%	74%	33,626	8,937	2.0
Semicentral Salaria - Trieste - Nomentana	86%	73%	38,105	6,032	1.4
Tiburtina	87%	49%	19,309	2,000	0.8
Appia - Tuscolana	91%	75%	19,025	1,470	0.5
Aurelia	85%	67%	23,751	1,837	0.7
Cassia - Flaminia	88%	71%	23,042	2,289	0.6
Cintura - Eur	90%	71%	11,469	1,212	0.5
Eur - Laurentina	93%	51%	25,049	2,911	0.9
Portuense	89%	67%	26,026	1,808	0.7
Salaria	90%	72%	33,583	3,391	1.2
Casilina - Prenestina	86%	67%	28,322	2,389	1.0
Outside G.R.A. - Est	79%	60%	31,047	841	0.4
Outside G.R.A. - Nord	78%	66%	5,464	317	0.1
Outside G.R.A. - Nord - Ovest	77%	73%	7,813	354	0.2
Outside G.R.A. - Ovest	74%	52%	8,919	326	0.1
Outside G.R.A. - Sud	69%	34%	4,083	169	0.1
Axis Colombo Ostiense - Litorale	86%	77%	29,593	1,233	0.5
N/A	84%	72%	8,869	-	-
ROMA	86%	64%	526,207	1,836	0.6

* Calculated according to criteria set by DPR 138/98.

Table 3 Determination of the "unitary value" of the territory: the case study of Rome

The Real Estate Market Observatory, as known, regularly provides an overview of the real estate prices extended to the entire national territory; if one multiplies such unitary quotations by consistency, expressed in terms of cadastral areas,⁴ of the real estate stock present in a given portion of the territory, it is possible to estimate the value, in a specific period, of its real estate assets.

Unfortunately, the prices or the consistencies are not available for all cadastral categories at the same time, and then it is not possible proceeding to estimation (consider, for example, categories D, E and F). In Table 3 we show the results of the estimation of the real estate stock present in a given portion of the territory for the municipality of Rome. According to the method described to estimate the real estate assets there is necessarily the exclusion of a number, sometimes not negligible, of real estate units and in columns 1 and 2 of Table 3 we indicate precisely what percentage of assets it has been possible to evaluate, respectively in terms of the number of real estate units and with reference to the corresponding percentage of income with respect to the total.

Taking into account caveat, the third column of the same Table 3, shows the data relating to the estimation of the real estate assets for each macro-area, by adding only the values of the "measurable" cadastral categories: homes (all A, except A/10), offices (A/10), shops (C/1), garages and parking spaces (C/6 and C/7), basement (C/2).

By distributing these values to the areas relative to the land parcels on which the buildings stand, it is possible to reach a sort of estimate of the urbanized "territorial units" (that obviously reflects any margins of incompleteness of the datum, deductible from the first two columns).

In spite of the unavoidable approximations, of which account has been given, the overview that emerges more or less faithfully reproduces the dynamics of estimation of the soil depending on the proximity to the city center which is then at the same time cause and effect of the processes of constitution of the land and real estate revenues.

Finally, the last column of the table shows an *ex post* formulation of the traditional building index, defined in fact as "construction", emphasizing in this way its descriptive and not forecasting character; it should be noted that the ratio (area of the buildings) was used as numerator to the overall cadastral area of the real estate units for which the value has been estimated, because available in data banks.

This is, in any case, data that can help to interpret the information of the previous columns, taking into account the intensity of exploitation of the portions of territory that has been analyzed on each occasion.

⁴ The areas determined in accordance with the criteria referred to in Annex C of DPR 138 of 1998 and available in the cadastral archives.

CONCLUSIONS

The evolution of the territorial government, as evidenced by the framework so far traced, then promises of considerable interest developments; as often happens, in fact, giving formal and/or substantial autonomy to the individual segments of a process urges for innovative pathways and, consequently, the maximum deployment of the overall potential.

In this sense, having attributed to the cognitive phase of planning a full and autonomous legitimacy has allowed, and will allow, not only to perfect the traditional analytical tools, but also to investigate new ones.

The attempt to compose a cognitive framework that integrates systematically planning information and economic information, synthesized from real estate prices, it fits exactly in this perspective, trying to fill one of the main shortcomings of traditional planning. Urban planning has long been aware of the importance that economic and financial dynamics have progressively taken in the territorial transformations, but attempts to increase the competences of the discipline have produced outcomes often too abstract (for example making reference to settlement patterns not easily replicable), sometimes overly deterministic (with inevitably approximate estimates of the context and variables involved), in each case without an appropriate degree of consistency.

As we have tried to illustrate in the previous paragraph, the structure of the data bases of the Real Estate Market Observatory and of the Cadastre offers, in this sense, innovative perspectives extremely interesting, which might help to bridge, once fully operational, this significant gap in the understanding of territorial dynamics.

It could trigger, in fact, at least two complementary levels of reading of an information system consisting of:

- one in space, able to compare the different "units" settlement and to investigate their relationships;
- one in time, able to read the dynamics, comparing territorial compositions in their evolution.

To this end it would be decisive, as said, to be able to confer consistency to the surveys, so as to compose, in perspective, suitably articulated historical series, useful for the understanding of settlement phenomena and for the preparation of strategic and operational guidelines of intervention. Instruments of this type, of course, can not substitute in any way, even partially, to the planning, but support it in the stages of knowledge and verification of decisions; the example in Table 3 was therefore developed only in the intent to comprehend the potential of the information system and can not be the place to develop additional and specific town planning interpretations.

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