

TeMA

Journal of
Land Use, Mobility and Environment

The three issues of the 12th volume will think again the debate on the definition and implementation of methods, tools and best practices connected to the evolution of the main scientific topics examined in depth in previous TeMA Journal volumes.

Tema is the Journal of Land use, Mobility and Environment and offers papers with a unified approach to planning and mobility. TeMA Journal has also received the Sparc Europe Seal of Open Access Journals released by Scholarly Publishing and Academic Resources Coalition (SPARC Europe) and the Directory of Open Access Journals (DOAJ).



THE TIMES THEY ARE A-CHANGIN'

TeMA

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Land Use, Mobility and Environment

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In these last ten years, TeMA Journal has published several international studies and researches supporting the scientific debate on the urban complexity and the future challenges of urban areas. Thus, the three issues of the 12th volume will think again the debate on the definition and implementation of methods, tools and best practices connected to the evolution of the main scientific topics examined in depth in previous TeMA Journal volumes.

The section "Focus" contains two articles.

The first article, titled "Good Practices for the Management of Fragile Territories Resilience" by Federica Pignatelli (Italian National Institute of Planning), Mariangela De Vita (Construction Technologies Institute, Italy) and Pierluigi Properzi (Italian National Institute of Planning). The physical and socio-economic reconstruction process of a territory damaged by a traumatic event at first pursues the path of emergency management and subsequently the rehabilitation of the damaged areas. These political and economic strategies are still unsystematic, so it is difficult to foresee either long or short-term effects. This paper presents an analysis carried out on the city of L'Aquila following the earthquake of 2009, in which indicators were defined to assess and monitor the reconstruction process.

The second article "Green is the colour. Standards, equipment and public spaces as paradigm for the Italian sustainable city" by Giuseppe Mazzeo (Italian National Research Council), Floriana Zucaro (University of Naples, Italy) and Rosa Morosini (University of Naples, Italy). The characteristics of Italian cities made urban equipment a symbol of democratization and quality of the cities, due to the obligatory of minimum quantities of spaces for public services. The 50 years from the issue of D.M. 1444 allows expressing a series of evaluations on the role of the public equipment in the processes of urban transformation and governance. Starting from this analysis, the paper proposes adequate and updated solutions in terms of the evolution of the standards categories and their quantitative and qualitative characteristics, deepening the role of the urban facilities as potential sources of innovation.

The section "Land Use, Mobility and Environment" collects three articles.

The first article, titled "Success Factors of Smart Cities: A Systematic Review of Literature from 2000-2018", by Abdulaziz Aldegheishem (King Saud University, Saudi Arabia), deals with the concept of smart City as it has been argued within the scientific literature in order to find out drivers and success indicators on which future research policies are depending. The author points out several drivers, related to different aspects, that stimulate cities to be smart. The aim of the author is to contribute to the scientific literature by showing what are and how some indicators can improve the transition towards the "smart city" conditions.

The second article, titled "Submission Title: Analysis of the first urban regeneration area in Kocaeli after Gölçük earthquake by using zoning plans", by Burcu Aslan (Kocaeli University, Turkey) and Cankut Dağdal İnce (Kocaeli University, Turkey). The natural disasters can be unpredictable, the issue of preparing cities for natural disasters, planning cities and regulating laws accordingly are becoming increasingly crucial. Urban regeneration activities are one of these preventions taken in this purpose. It is observed that countries such as Turkey, faced with natural disasters intensively, suffer from serious physical, financial and moral losses. It

is important not only to make urban areas more resistant to disasters but also to design according to social, economic and ecological criteria to make more livable. In this study, social, health, green, transportation and educational areas of the first urban regeneration area in Kocaeli were examined in terms of the basic needs of the city.

The third article “Impacts of Land Disputes on Community Development”, by David Ngwoke Mbazor (Federal University of Technology Akure, Nigeria) deals with an important issue especially for developing and transition countries: the issue of impacts from land ownership on urban and infrastructural development. Through the statistical analysis conducted on 317 questionnaires of the Inyimagu community in the state of Ebonyi in Nigeria, the paper proposes solutions including the review of land law.

The section “Review Pages” defines the general framework of the issue’s theme, with an updated focus on websites, publications, laws, urban practices and news and events on the subject of the Resilience City and the Fragile City. In particular, the Web section by Rosa Morosini describes three web resources of: (i) The Euro-Mediterranean Center on Climate Change; (ii) Central and Eastern European region web for Biodiversity and (iii) State of the Planet. The Books section by Gerardo Carpentieri briefly reviews three relevant books related to the Issues’ theme: (i) Outer Urban Public Transport. Improving accessibility in lower-density areas; (ii) Autonomous vehicle ride-sharing services and (iii) Environmental and territorial modelling for planning and design. The Law section by Maria Rosa Tremitterra keeps readers up to climate change adaptation plan with an overview about the Italian regional context (Lombardy and Emilia-Romagna regions). The Urban Practices section by Gennaro Angiello presents two case studies of planning for digital transformation at the municipal level: (i) Barcelona (Spain) and (ii) Baltimore (Unite States). The News and Event section by Andrea Tulisi, select conferences deliberately deal with different issues not necessarily related to the theme of resilience, but which basically question on the future of cities.

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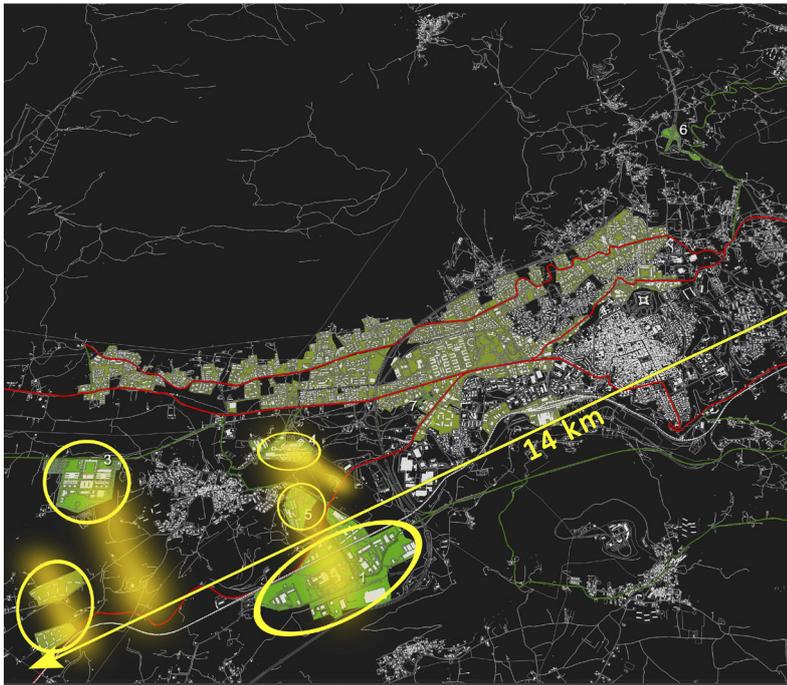
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GOOD PRACTICES FOR THE MANAGEMENT OF FRAGILE TERRITORIES RESILIENCE

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ABSTRACT

Italy is a territory frequently affected by natural disasters that have a huge impact on urban transformations. The physical and socio-economical reconstruction process of a territory damaged by a traumatic event at first pursues the path of emergency management and subsequently the rehabilitation of the damaged areas. These political and economic strategies are still unsystematic, so it is difficult to predict either long or short term effects. This paper presents an analysis carried out on the city of L'Aquila following the earthquake of 2009, in which indicators were defined to assess and monitor the reconstruction process. The method used to define the indicators is 'absolute', in such a way as to represent a replicable model that can be adapted to different territorial and emergency contexts. Furthermore, the set of indicators proposed can be used not only to monitor the reconstruction process, but also to guide public policies and to suggest shared strategic guidelines, not originated by the urgency of after-shock conditions. The proposed model is a tool to be used from the early stages of reconstruction, in order to predict the outcome of the reconstruction itself. In this way, it is possible to manage urban transformation in a coherent and organic way in all its phases by adopting a single tool. The use of the model shown in the research also makes it possible to enhance the resilience of a territory by exploiting its intrinsic characteristics.

KEYWORDS:

Reconstruction Indicators; Post-earthquake Reconstruction; City Resilience; Territorial Transformations; Fragile Territories Management; Guide-lines

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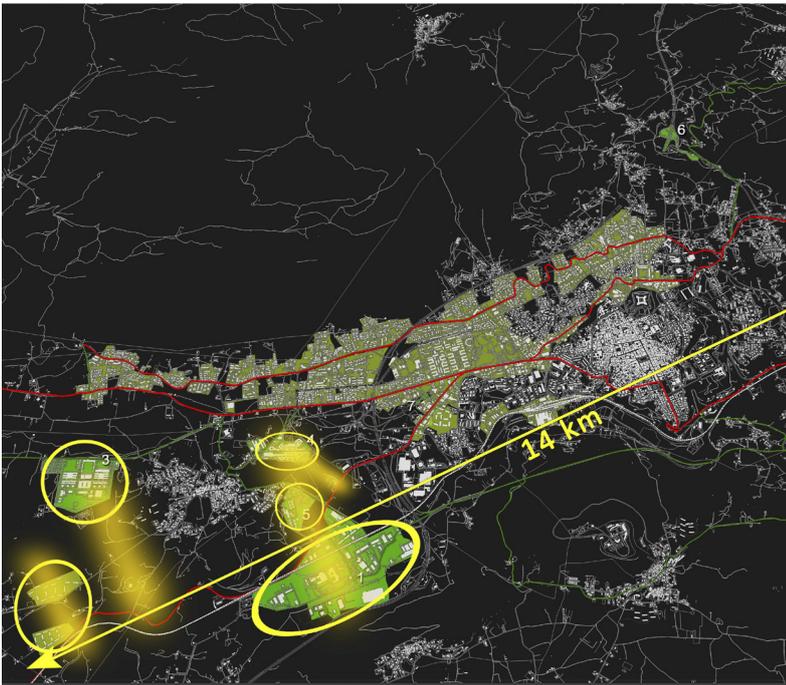
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管理脆弱区域恢复能力的有效措施

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摘要

意大利的国土频繁遭受自然灾害的影响，这对其城市转型造成了极大的影响。在对遭受破坏的区域进行物质和社会经济重建过程中，首要任务是应急管理建设，其次是对受损区域的复原。而重建过程的政治和经济举措仍处于无组织状态，因此难以预测其长期效果。本论文就2009年地震之后的拉奎拉市 (L' Aquila) 展开分析，制定指标以评估和监测重建过程。用于制定指标的方法为“绝对法”，以此呈现一个适用于不同区域和紧急情况的可复制模型。此外，文中提及的一系列指标不仅可用于监测重建过程，还可针对非灾后紧急情况为公共策略提供指引，以及提出共用的战略指导方针。该模型是一种可用于早期重建阶段的工具，旨在预测重建结果。这种方式能够通过单一的工具，对城市转型的所有阶段以连贯且有机的方式进行管理。对研究中所示模型的运用还可利用区域的内在特征以增强其恢复能力

关键词:

重建指标; 地震后重建; 城市恢复; 区域转型; 脆弱, 域的管理; 指导方针

1 INTRODUCTION

In recent decades, politics and research have confronted each other to reduce the impact of disasters on society: international agencies and national governments have begun to define clear objectives and commitments for disaster reduction. The Hyogo Framework for Action (HFA, 2005-2015) and the subsequent Sendai Framework for Disaster Risk Reduction (SFDRR, 2015-2030) represent fundamental steps in this sense. The policy and the global research area by which nations are trying to reduce the vulnerability is therefore "Disaster risk reduction" (Aitsi-Selmi, 2015). In the last years DRR has been strictly related to resilience, that assumes a key role in promulgating worldwide vulnerability reduction (Paton & Johnston 2017). The substantial effort among global agencies in trying to mitigate the disastrous effects was accompanied by abundant academic discussions and analyses on both "DRR" and "resilience". The current academic debate and discussion do not currently show clear signs of convergence towards a concerted series of concepts to be used in practice. However, the relation between the reduction of disaster impacts and resilience has been deeply argued by T. R. H. Davies and A. J. Davies (Davies & Davies, 2018). Italy is characterized by complex urban areas and territories, which derive from long processes of urban transformation determined not only by social and economic reasons but also substantially defined by natural calamities. The need to 'rehabilitate' the places devastated by traumatic events, immediately poses the problem of intervention modes, which widely depend on the political and strategic choices of the public administration. To this date, there is a lack of operational procedures that are able to conduct the reconstruction process in an organized and coherent way, from the first phases of emergency management to the completion of the reconstruction process – that is physical, social, economic and cultural. The strategic choices are determined by the outcomes of this process. These currently appear to be unpredictable because they are the result of a management lacking in the method. Governance actions, in the attempt to find a balance between eliminating dangers in the immediate after-shock and preserving the physical nature of places, should not be conditioned by the availability of resources. What really happens is that the economic issues begin, already from the first stages, to condition the future structure of a territory (Fiorani, 2018), also because of the fact that the strategic choices are mostly made only during full emergency rather than in anticipation of an event. With regard to the architectural scale, the intrinsic adaptability of Italian cities is evident in the numerous transformations, which followed the frequent traumatic natural events. These have been able to preserve the features of historic buildings and their contexts. In fact, the authentic preservation of historical architecture allows us to better understand and interpret various aspects of considerable importance, e.g. materially documenting both the previous vulnerabilities and the ability to adapt to traumatic events that have occurred in the past (Bartolomucci, 2018). Transferring this to a larger scale, it would be reasonable to state that the Italian territory, and the Italians themselves, have a 'natural predisposition' to resilience that has facilitated the adaptation of a huge cultural heritage - which includes buildings, historic centers and landscapes - to a more modern way of fruition and with renewed potential. Recognizing the quality of resilience to the Italian territory is also possible thanks to the weak definition that is attributed to this concept from both scientific literature and executive practice, with which the processes of transformation and enhancement of a territory are tackled. Indeed, Rizzi et al. highlight how over time the concepts of risk management and vulnerability assessment are evolving towards a direction that abandons the reduction of the city/territory fragility, to the benefit of its ability to adapt: in this adaptability resides the degree of resilience (Rizzi, 2017). Borsekova et al. state that resilience of cities can be perceived as a "roof" or "umbrella" of an urban system that is formed by four main pillars – economy, society, institutions and environment – and these pillars stand on the foundation stones of adaptability, robustness, flexibility, resources, inclusiveness, redundancy and integration (Borsekova, 2018). Therefore the DRR seems to be the best defined and understood term, perhaps due to its relationship with the consolidated discipline of Risk Management; clarity in the use and meaning of "resilience" is less obvious. The lack of clarity on the concept of resilience can be associated, in a first phase, with the impossibility of quantifying its dimensions, due to the

qualitative properties that are not measurable and which are usually attributed to them. If the resilience must be one of the standards for determining the ability of a territory to adapt in relation to its risks and fragility, it must necessarily be measurable, as all the others standards. For this reason, in recent years scientific literature has highlighted the need for the identification of a method and a multidisciplinary and interdisciplinary approach to planning, which the sole "Regulatory Plan" is not be able to guarantee. For this purpose, different IT platforms and models have been set up in an attempt to unify and manage knowledge through dynamic control tools. A study (Di Lodovico & Di Ludovico, 2017) reports the analysis of 8 platform models developed to allow and facilitate the interaction between different actors in the transformation project of an urban context, integrated with sensors for monitoring or supported by appropriate indicators. Furthermore, D'Ascanio et al. illustrate how resilience is becoming a necessary component for the achievement of sustainability standards set by E.U. for Smart Cities (D'Ascanio, 2016); the transition between Smart City and Smart Territory is possible thanks to the use of enhanced and at the same time simplified governance tools (Di Ludovico, 2014). In this paper a methodology for the definition of a set of indicators is presented. The method shown can represent a guide in post-disaster reconstruction processes. The need for the development of this methodology originates from the earthquake that hit the city of L'Aquila in 2009. On the basis of the data obtained from the analysis of the emergency and post-emergency phases, it was possible to identify a replicable model for assessing the reconstruction process and for disaster management. This method is based on the choice of indicators presented by the research, suitable for use for the definition of the strategic and operational lines of intervention also.

2. TOOLS AND METHODS

That natural disasters occur is undeniable. Preparing to cope and react in a best way is essential. According to Molavi (Molavi, 2018), a resilient city can survive after a devastating trauma. The concept of resilience was initially both associated and placed in opposition to the concept of vulnerability. The strategies adopted to reinforce the resilience of a territory were therefore aimed at reducing its vulnerability. Subsequently, within the scientific debate, resilience was associated to a broader vision and is thus no longer bound to the reduction of vulnerability only. For Colucci (Colucci, 2012) the capacity of a territory to be resilient depends mostly on the degree of organization in a territory at the stage prior to the event. In fact the better prepared the system, the quicker it will return to normality. The integrated use of appropriate management tools is necessary to achieve a resilient city vision. The indicators are qualitative and quantitative measures resulting from the facts systematically observed which describe the characteristics of certain phenomena analyzed in order to allow their evaluation (Martinez & Dopheide, 2016). In recent years, the management, monitoring and evaluation of a post-disaster reconstruction process are emerging topics in the field of scientific research. The main challenge presented to local governments is the effective management of both the emergency phase and the urban and territorial transformation process linked to the physical reconstruction of homes and infrastructures and to economic and social recovery. Until recently only few researchers have attempted to synthesize the entire reconstruction process. *Reconstruction following disaster* (Hass, 1977) is one of the few case studies that has analyzed a reconstruction process completely. Hass, Kates and Bowden in their research state that, as result of disaster, reconstruction actions are more effective and easy to achieve if there are existing intervention policies and action plans. Another significant contribution to literature on Reconstruction was a 1998 publication by the American Planning Association "*Planning for Post-disaster Recovery and Reconstruction*" (PAS Report, 1998). According to the researchers, the reconstruction process would have more chance of succeeding if the cities were already equipped with a reconstruction plan within the existing planning instrument, in order to reduce the possibility of decisions that could limit the future development of the territory affected by the disaster. There is an existing inherent trend in the search for a model that could be useful for public administrations to define in advance the priorities of a reconstruction process. It can be

said, however, that most of basic literature does not deal with the Process of Reconstruction in its entirety, but almost always focuses on certain aspects and is so lacking in many respects. The use of indicators in the monitoring of the urban transformation process can be considered a method of efficient management of city/territory fragility, as they are able to describe and evaluate multiple parameters and variables that exist, such as the different geographical scales and the different timing of the phases related to the event (emergency-reconstruction). "Furthermore, the use of indicators, in addition to encouraging the development of basic knowledge and hypothesis testing" (Chang, 2009), "guarantees objectivity in process analysis and allows comparison between different case" (Shohei, 2007). It must be noted that literature on these issues is very scarce. In a study Saporiti et al. (Saporiti, 2012) hypothesize a panel of indicators able to assess the degree of recovery of a territory by placing the problem at different levels, including the global and the local, the individual and social/community spheres. The contribution proposed takes into account the current debate within the urban planning discipline, which revolves around the refusal of the plan as a promoter of development. For this reason, "now the traditional paradigm of regulation seems obsolete" (Calafati, 2014). For these reasons, the management of the development trajectories is entrusted to the same Set of Indicators which is meant to monitor the reconstruction process. This paper suggests a planning model that helps to overcome the system provided for by Law 1150/42 and which provides definite principles and development guidelines. A simplification of the system which has in the 'Indicators' a flexible and adaptable instrument is thus predictable. The Set of Indicators will guarantee the future vision of the territorial and urban layouts, because it is, at the same time, both a frame for urban policies and a reference table for the evaluation of the urban transformations begun by the process itself. The proposed method uses the Indicators not only to monitor an ongoing transformation process, as described in the case study of L'Aquila, but also to guide the initial phase of definition of the Strategic Lines and actions of the reconstruction. The effectiveness of the method presented consists also in the possibility of considering all the dimensions of the system, physical, economic, social and not only the urbanistic dimension.

3. URBAN TRANSFORMATION IN POST-EMERGENCY CONTEXTS: THE CASE STUDY OF L'AQUILA

On the 6 April 2009, an earthquake of magnitude 6.3 Richter hit a large portion of the Abruzzo region in Italy. The greatest damage occurred in the city of L'Aquila and in the 20 neighboring towns, affecting an area in the Apennines with a significant industrial presence and a vast rural presence. The total population involved (1 January 2009) was 144,415 persons, equal to about 11% of the regional population and 0.2% of the national population (CRESA, 2011). The buildings damaged or destroyed, only in the municipality of L'Aquila, were between 10,000 and 15,000, thus causing the temporary evacuation of about 72,000 inhabitants and leaving about 67,500 homeless. More than 50% of the 'crater'¹ population resided in the Municipality of L'Aquila alone. This occurred together with the effects of the economic crisis that began in 2008 and continued in the following years.

3.1 THE SOCIO-ECONOMIC SYSTEM AND THE NEW URBAN SHAPE

For more than the last decade in L'Aquila, a very weak economic development has been taking place, made uncertain by the ongoing profound institutional and economic changes. Consequently, once the factors that had generated a development trajectory over the past decade had been exhausted, the city found itself in a phase of economic deadlock to which local institutions did not give much importance, trusting in the economic stability that the role of administrative and university city seemed to guarantee. During the decades preceding the earthquake, the economy of this territory was characterized by a poor integration between the

¹ "Cratere" and "Cratere Sismico" describes in Italian the list of municipality damaged by an earthquake.

manufacturing sector and the other sectors, including incomes deriving from Public Administrations and apartment rentals. The development of the University had helped to create the detachment between sectors. The local economy tended to exploit the position revenues. The result was a high degree of fragmentation, also due to the lack of coordinated strategies. The earthquake struck a city that was in a phase of economic stagnation, due also to the international economic crisis of 2008, and without a certain strategy of development. The earthquake accelerated the processes of transformation of the socio - economic structure. These are weakening the innovation and development capacity of the city and its territory. This is because the focus of decision-making processes has been addressed towards the reconstruction of the physical system, overshadowing the economic development issues. The infrastructures comprising both public and private building assets were damaged. It is particularly difficult to quantify the damage linked to production activities. In fact, in addition to the buildings, the damage suffered by equipment and machinery, or those resulting from the loss of stocks, must be considered. At the same time, the indirect damages deriving from the drop in demand due to the partial or total interruption of activities must be estimated. In addition, the loss of revenues resulting from the cancellation of orders and the damages related to the costs of relocating production and / or service activities have to be considered. More than 50% of the total active units present in the 57 Municipalities of the 'Cratere sismico'¹ are concentrated in the Municipality of L'Aquila. Before the earthquake, from a spatial point of view, L'Aquila was a city built in parts. A polycentric dimension held together the multitude of hamlets and inhabited centers - some large (Paganica: 5,000 inhabitants; Pianola: 1400 inhabitants) and others far from the main nucleus (Arischia: 8 Km; Assergi: 14 Km); a linear dimension, constituted by the settlement system located along the Aterno valley, extends for about 14 km. At the same time a diffuse and porous dimension coexist, and this is represented by urban voids, abandoned areas and important natural reserves. In this differentiated system, the identity recognized by all the citizens of Aquila who lived inside the ancient walls and in the hamlets, was the city's historical center. With respect to the historical center, in the years of the post-war construction expansion, the city was disposed to the east and to the west in an initially balanced manner and then, over the years, hierarchized and unbalanced towards the west. During the eight *LaurAq* workshops, held in L'Aquila in June 2010 following the analysis of the transformations that affected the city of L'Aquila after the earthquake, seven definitions of the city have emerged:

- '*città coerente*' (coherent city): that part of the city built within a system of shared rules, which has maintained a relationship of coherence in its different parts. It is the historical part of the city that extends its perimeter just outside the ancient walls;
- '*città consolidata*' (consolidated city): the city where the coherence has disappeared but within inside a homogeneity of the urban structure it is still recognizable, but that was deficient even before the earthquake. It extends its perimeters close to the highway that constitutes its invisible limit;
- '*città in formazione*' (city in progress): the residue of an unfinished plan. It is discontinuous within the urban structure that has different densities due to a significant presence of empty spaces, abandoned spaces and without a definite destination. It includes the outermost suburbs to the east and west;
- '*città delle frazioni*' (city of hamlets): plays an important role because the polycentrism of the hamlets, originally failing, has been strengthened as a result of the earthquake;
- '*città dell'emergenza*' (emergency city): born in opposition to the voids generated by the various 'Zone Rosse'², it was built in five months without a settlement rationality. It thus constitutes a difficult urban problem due mainly to its size (about 18,000 inhabitants), the consumption of soil and its social and economic issues (Fig. 1.a);

² The " Zone Rosse" are devastated areas forbidden to the general public.

- ‘*città lineare*’ (linear city): pre-existing to the earthquake and derived from the industrial locations of the '60s, today is emphasized by the new ‘C.A.S.E.’³ locations and from the relocation of urban and territorial equipment in industrial agglomerations. This Linear City has determined an erratic and ungovernable mobility, because of lack of a linear infrastructure of public transport (Fig. 1.b);
- ‘*città dello sprawl*’ (sprawl city): following the earthquake, there was ‘an explosion’ and a redistribution of population and facilities. This dispersion in the territory is underlined by the sprawl - 800 authorized buildings and as many unauthorized (data from L'Aquila Municipality 2011) emerged from the municipal deliberations that were liberalized. The construction of residences and productive activities in the municipal territory was carried out, in derogation of environmental landscape restrictions. The metabolization of these areas is still particularly difficult (Di Cristofaro & Pignatelli, 2011). This has happened because the phenomenon of urban sprawl has been recognized as one of the main anthropic threats with regard to natural landscapes. However, it is a theme only marginally addressed within the process of local development management (Zullo, 2015) (Fig. 2).

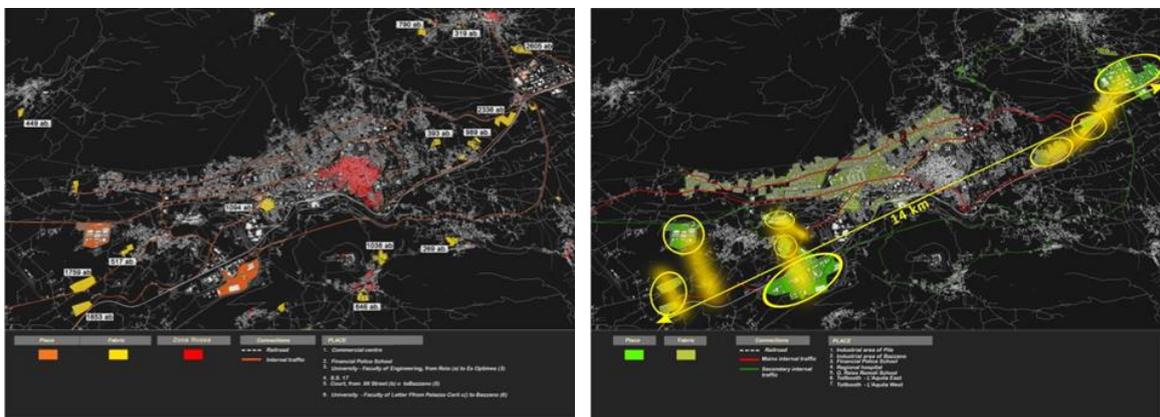


Fig. 1 (a) Emergency city (left); (b) Linear city (right)

The earthquake caused a weakening of stratified urban balances with long-lasting and difficult-to-contrast effects. Thus there was a break with the existing urban network and its morphogenetic role. The subdivision of the city in the seven cities listed above, has led to a distortion of the functional mix, a banalization of community living spaces and a loss both of proximity relations, which constitute the binding of community life, and urban relations between the different parts of the city, causing a weakening of the system of public spaces and an increase in the erratic mobility.

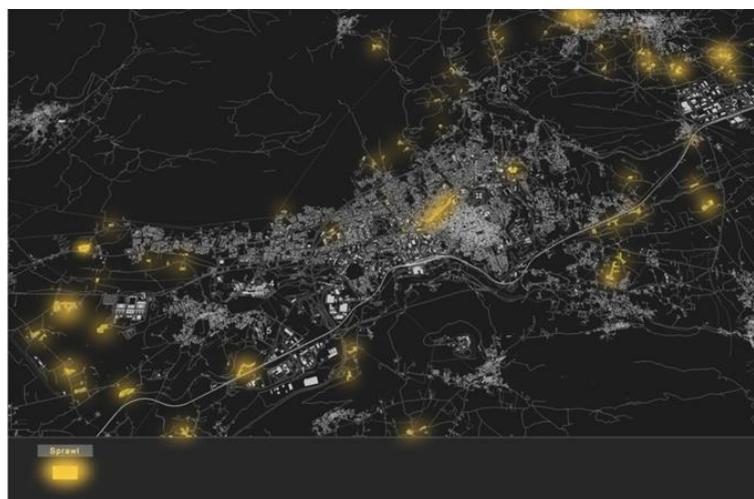


Fig. 2 Sprawl City: the sprawl is highlighted in yellow

³ ‘C.A.S.E.’ this is an acronym describing emergency temporary housing.

3.2 THE PROCESS OF RECONSTRUCTION, GOVERNANCE SYSTEM

The Reconstruction of L'Aquila was proposed in the aftermath of the earthquake of the 6 April 2009 as a particularly complex issue both for the uniqueness and the size of the phenomenon - the devastation of one of the most important and extensive historical cities of Central Italy – and the reconstruction itself. This is because the reconstruction is not reconnectable to the traditional disciplinary systems. This aspect especially has led to a reflection on the adequacy of the discipline in case of emergency processes and on the congruence of a traditional approach to the issue/problem (regulatory and forecasting) of reconstruction, which for its significant exemplarity and uniqueness misses in the experiences of strategic planning and in advocacy planning reference solutions. The themes of economic reconstruction of the affected communities (in L'Aquila this is an extremely complex matter and it is rooted in terms of identity and local characterizations) and the integration of the economies in crisis again due to the earthquake. The original economies must compete with new and aggressive economies of reconstruction. The management of these processes has tried to find its solution in Governance, defined by ordinances and decrees. (LAURAq, 2010). Within the process of reconstruction distinct phases emerge. In the early days following the disaster, the Central Government issued a comprehensive regulatory framework. This phase began with the enactment of Decree Law N° 39 of 28 April 2009 and Law 24 June 2009 N° 77. This was a primary legislation which envisaged General sectors of intervention and that gave impetus to two successive commissarial management models, until the application of Law 134/2012. This norm marks the third and final phase of reconstruction, which decreed the end of the State of Emergency by returning the management by a Commission (3 years) to an ordinary regime after a long time. This management has produced an acceleration of Private Reconstruction. Even so, notwithstanding the simplifications introduced, a sliding must be registered of the predictions made in the report presented Parliament by the STM⁴, which indicated the year 2022 as the year in which work would be concluded. This failure can be attributed to the interpretation of an exclusively programmatic nature of the reconstruction plan, introduced by the Law 77/2009. This erroneous interpretation has resulted in the inefficiency of the Law. The case of the city of L'Aquila may be read as a metaphor of urban disciplinary insufficiency that the scenario of the earthquake has sent into crisis (Properzi & Di Ludovico 2018).

4. THE RECONSTRUCTION OF L'AQUILA: LOOKING FOR A PERSPECTIVE

The process of reconstruction is an issue that spans various sectors, both public and private, and intangible assets, economic and social. In the city of L'Aquila the management of the territory did not have a guiding vision; the proposals and the instances were found to be inefficient when coping with the ever greater problems encountered within the city lifestyle. This inefficiency was found also in the Process of Reconstruction of both physical and intangible relations (Iagnemma & Pignatelli, 2013). It follows that the Reconstruction Process establishes a different perspective with which to view the city and his Government, referring to the various areas of planning and using what is called an integrated approach. The integrated approach implies the need to address the many aspects that affect the Urban Governance of the reconstruction simultaneously, in order to form a collective strategy within which to develop policies and management interventions. For this reason, the essential role is played by strategic planning, which must act on various aspects of the process. The words 'strategic planning' refer to a planning model that involves a project action where the boundaries between urban planning and management policies are weak and mostly do not have relevance to the goals that the reconstruction gives. In Italy the Regulatory Plan, intended as a land management tool, can gain form and content. Since the early '90s, in our country an evolution has been taking place that is making the Regulatory Plan more and more flexible by means of regulatory functions and also with strategic and address functions. The Regulatory Plan is now increasingly seen as a local development process which sees spatial

⁴ "STM" Struttura Tecnica di Missione constitutes in L'Aquila (Italy) the body at the base of the commissarial management models

planning interacting with economic development. Regardless of what is happening at the regulatory level, it is interesting to reflect on the opportunities that this transformation entails.

The complexity of contemporary Planning that embraces diverse areas inevitably refers to a participatory logic, of which the same building process is an integral part. This is not to speak about mere cooperation between institutions or coordination skills, but organic and mandatory participation by all the territorial Governments. There are all those actors that already provide their views on the choices of planning in separate locations, and that should instead assess the compatibility of the proposed spatial planning on the basis of shared cognitive frameworks (INU, 2009). Management models for emergency and reconstruction in the city of L'Aquila fluctuated between governance and government. The various forms of the plan also fluctuated among the conformative, normative and predictive traditions and the innovative and strategic ones. (Andreassi & Properzi 2012). This logic invokes other aspects, not at all obvious, as the awareness and political commitment from the Administration, institutional innovation in terms of governance, the creation of mechanisms for preparation, monitoring and evaluation necessary for the establishment and implementation of the process. A process, irrespective of the type of target, the size of the catchment area and the specific objectives, is based on the integration of different components, through a model, complex by nature and that must obtain, efficaciously and efficiently, the expected result, ensuring at the same time a suitable return in terms of costs/benefits. To ensure that this occurs the strategies must be detailed and the objectives well specified. A well-defined planning process involves having to work not only on the design choices, but also on building cognitive frameworks and indicators.

Following these directions, the process of reconstruction should be able to:

- construct an in-depth and details knowledge base for each sector set on the participations of the local actors through an integrated analysis (economic, social, urban, environmental, cultural, etc.);
- facilitate understanding of the local context;
- prepare objectives shared by all local actors;
- divide objectives in to obtainable and define programs and projects;
- submitting the results to a continuous process of follow up (periodic and scheduled inspections).

The specific objective of the research is the definition of a Set of Indicators that serves to develop guidance for post disaster reconstruction.

The research therefore presents a Set of Indicator useful for developing Guide-Lines for after-shock reconstruction. These Guide-Lines must apply to the strategic direction (objectives) that must be obtained through the reconstruction process. The Guide-Lines will therefore be used to start co-planning policies through acquiring of actions necessary for the termination of the reconstruction.

The approach chosen uses a replicable model for defining a set of indicators to monitor the process itself. This provides a tool to be used not only in progress during control, but also at the initial stage of defining the strategic lines and actions. In this way it will be easier to measure the efficiency of the processes because the information takes into account all the dimensions (physical, economic and social system) of the reconstruction (Pignatelli, 2016). "In analyzing the literature in this regard, it is important to clarify that the use of indicators in this sense implies an approach that does not include the analysis for parts of a complex system, but consider each part in its specific and particular context" (Vallega, 2008).

Another important concept related to this approach, is the circular logic within which the use of indicators is placed in order for the approach itself to become effective. The cycle is already at the base of the model of 'policy life cycle', developed by Winsemius in the '80s. "This model structures the decision-making process in 4 phases and involves the use of indicators both in the design phase and the evaluation of policies" (Caciotti, 2010). Within the process of reconstruction, the circularity is noticeable because the relationship between cause and effect (actions and policies) determines a continuous, circular path in the application of indicators and revision of policies.

For this reason the reference used for the definition of the set of indicators, able to guarantee the maximum of effectiveness of the Process of the Reconstruction as mentioned above, is the one called PSR (Pressures, States, Responses). This model, proposed for the first time by the OECD in the 1994 in the environmental field, allows not only to organize synthetically the information but more explicitly it is the expression of a way of understanding the relationships between society and the surrounding system, through a schematization of the complexities of the system analysed:

- Pressures: impact factors which have the general form of emission or removal of resources;
- State: state of the art of the different components of the process;
- Responses: objectives/policies that individuals responsible for the territorial Government should achieve.

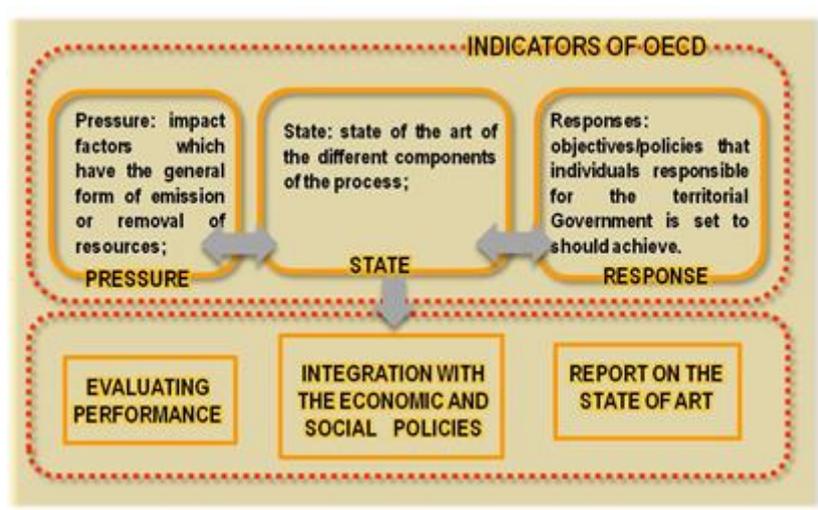


Fig. 3 OECD model: relationships between Pressures, States and Responses

The components, and related indicators, of the PSR model are connected by a circular logical relationship according to which the pressure acting on the system influences the state of the system itself which, in turn, determines the responses to be put into action to achieve the desired standard by reducing pressure on it. The model PSR evolved in the DPSIR model (Determinants, Pressure, State, Impacts, Responses), proposed by the EEA in 1995. This highlights two phases (Determinants and Impacts), already implicitly present in the previous model, but providing a more articulated scheme. In the present research, however, it was thought to use the previous PSR model, because it is simpler and it is considered more effective in describing the complex mechanisms of the Reconstruction Process. It is therefore worthy of note that there is a causal relation in the sequence of the model PSR Pressure-State-Response. The feedback loop, that is the ability of a system to take account of the results in order to change the characteristics of the system itself, develops on a scheme whereby the answers (the policies) can act independently on other elements without affecting the circularity of the process, but rather allowing the Administration to act promptly within it (scheme in Fig. 4). The purpose of this model is therefore to optimize the learning phase with those of processing and evaluating or monitoring the process of reconstruction.

4.1 THE INDICATORS FOR THE PROCESS OF RECONSTRUCTION

Within the process of reconstruction, 3 basic elements are highlighted:

- Inputs - the information entered in the process of undergoing a transformation;
- Constraints, rules and controls - the procedures and measures required to carry out activities that make up the process itself;
- Outputs - the resulting information.

Schematically, the reconstruction can be represented as a 'box' where input, constraints, rules and controls enter and return as output. Unlike inputs, constraints, rules and controls enter into the 'box' but do not undergo any change. We can affirm that the outputs are the object of transformation while resources, constraints, rules and controls are the entities that enable the development of transformation in an optimal manner.

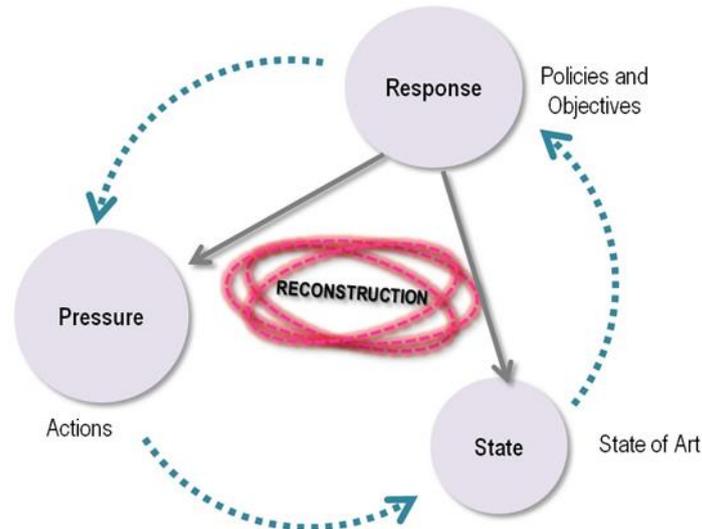


Fig. 4 Process circularity in the sequence of the PSR model

The research focuses on generating a replicable model for defining a set of indicators, which can be understood as a guide on one hand and as a check on the other. The Set of Indicators thus generated can be used to guide the implementation of the process itself, to monitor whether there are deviations from the objectives set in progress, or retrospectively (once it has been implemented completely) for verification purposes.

The Set of Indicators should cover essentially all aspects of the process, since it serves to generate and/or measure the achievement or non-achievement of a standard. For this reason it is a means of documenting and investigating, through the use of physical and structural data, certain classes of phenomena. It is an organized collection of information retrieval that occurs through the systematic study of the development of a particular phenomenon, in order to observe the evolution of variables over time. Indeed, it takes place in the form of periodic detection and on a regular basis. We can say, then, that the ultimate goal of defining the Set of Indicators is to understand what the positives and negatives outcomes are by comparing them with the analyses carried out during the previous period.

From this point of view the extent of the phenomenon is the focus of the management of a process. It allows to locate the data to be collected and analysed, to document the development of current activities, identify strengths and weaknesses and therefore guide the phases of improvement.

It is known that with the growth of the amount of data, it is increasingly difficult to manage the system. The indicators, then, must fulfil three basic functions:

- Control - the indicators are used to evaluate and monitor the performance of the process itself;
- Communication - the indicators allow you to disclose the performance of a process to all actors by providing quantitative information not otherwise available. Indicators that are little representative of a process can determine conflicts and confusion;
- Improvement - the indicators identify performance gaps between expectations and results. The magnitude and direction of the gap provides guidance for the development of strategies to optimize the process.

The basic functions of the indicators revolve around a standard; their aim is an expected outcome that is the measure of the goal itself. The expected outcome, in the specific case of the process of reconstruction, is what

Public Administrations expect to reach once their policies have been implemented. The indicators are used to measure the actions and the results that ensue; therefore, if used without the right precautions, they can lead to a distorted analysis of the processes and can encourage incorrect procedures. In the proposed model, each sub category of reconstruction is represented by a number of indicators, which have specific connections among them in compliance with the circular logic of the process (Fig. 5).

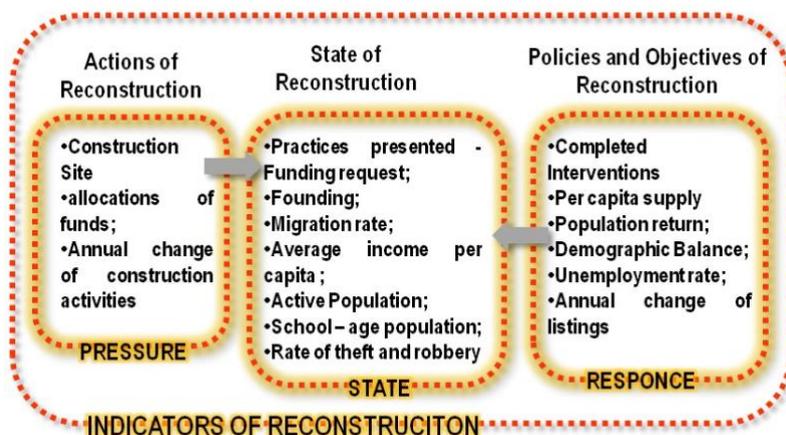


Fig. 5 The model proposed in order to obtain reconstruction indicators following the PSR process

Definition of the indicator set

If wishing to create knowledge that will serve as a base of the process of reconstruction, concern is generated by the existence of a multitude of aspects involved within the process itself and from which to begin. It is this plurality of facets which is reflected in the construction of the Indicator Set. It is clear that we must avoid focus on individual points of view and that we should, instead, find a common matrix.

Of course the process of reconstruction is defined through an idea of complex relationships, having as scenario the territory devastated by an earthquake. It is important to emphasize that in this context the object Process of Reconstruction is described by parts that are both tangible and intangible: flow of people, energy and matter -both internal and from the surrounding territory- in their intermingling define the quality. "It follows that the system to be proposed cannot limit its end exclusively to issues of physical reconstruction, but should also cover the issues of socio-economic development and welfare" (Vallega, 2008). The Set of Indicators must then be able to lead the Reconstruction, described according to its two qualitative and quantitative characteristics and according to predetermined objectives, by analyzing all the factors that affect the performance. With this tool you can also favour a system of public policies that can spread the knowledge of the process of reconstruction in such a way as to involve the citizens through direct participation. The fields of application of the indicators can be identified and grouped into two categories: 'Material Category' and 'Intangible Category'. 'Material Category' serves to define the capacity of physical reconstruction, by investigating the State of the Art of the buildings (private and public), the progress of expenditure and the socio-economic system; 'Intangible Category' considers and assesses the requirements and performance of the territory by analysing factors such as the economic demographic attractiveness, the economic dynamism and the social welfare. Within the 'Material Category', indicators represent the process of reconstruction in a structuralist form. The individual and the community are left out: the social perception of the process is considered only if it ensures that the process itself can be represented as a machine. We limit ourselves to tangible elements, material realities, that can be separable. The 'Intangible Category' both joins and is opposed to the material category. In this case the process of reconstruction is considered mainly in relation to the perception of local communities. It does not refer to an object but to a socio-economic subject representative of the development.

Considering this perspective, the process of reconstruction is no longer seen as a machine but as a set of values that should be considered in their entirety.

The relationship between the two categories of indicators and the PSR model, that underlies the proposed method, can be better summarized through the following table:

PSR Model and Categories for Reconstruction	
Material Category	Immaterial Category
The Reconstruction Process is represented as a disaggregable reality (Pressure indicators)	The Reconstruction Process is represented as a non-disaggregable reality (Pressure indicators)
The Reconstruction Process is represented as a machine, in which the relationship that links the inputs to the outputs is clearly evident (Response indicators)	The Reconstruction Process is represented as a set of values considered in their entirety (Response indicators)
The Reconstruction Process is summarised through indicators that describe and explain it in its entirety (Status indicators)	The Reconstruction Process is summarized through indicators that help to understand the progress of socio-economic development (Status indicators)

Tab. 1. PSR Model and Categories for Reconstruction

For both main areas the definition of the Set of Indicators is obtained through the same process.

In the first instance themes representing the two categories have been identified:

- Material Category (CRFE): Architectural Heritage (private and public); Progress of Expenditure; Socio-Economic System;
- Intangible Category (CRPE): Demographic Attractiveness; Economic Dynamism; Social Welfare.

Subsequently the strategic objectives of the reconstruction were defined to match as many indicators:

- responsiveness;
- transparency;
- timeliness;
- certificates (internal consistency);
- resilience;
- reliability.

Set goals can affect the choice and definition of indicators. For this reason it has been useful to build a 'matrix of relations' between targets and indicators so that it is possible to understand how a single indicator could represent one or more targets simultaneously.

In order to understand which of the proposed indicators better describe a phenomenon, the matrix alone was not enough. It was decided to proceed using the Pareto Method: the Pareto analysis is a statistical technique that can be used to support decision making necessary to identify the significant subset of causes or actions that produces the highest percentage of effects.

The most significant passages of the Pareto analysis are:

- constructing a table that associates each because its frequency of occurrence as a percentage;
- arranging table rows in descending order of importance;
- adding a column with percent cumulated;
- developing a line plot with causes on x-axis and cumulative percentages on the y-axis and interpolating the points (diagram of percent cumulated);

- developing the same template a histogram with the x axis and the y axis causes associated to the corresponding percentages;
- locating the intersection point with the curve traced by a line parallel to the x-axis and the aggregate value of 80% on the y axis. (Project Manager Center, [www.http://www.humanwareonline.com/project-management/center/analisi-di-pareto](http://www.humanwareonline.com/project-management/center/analisi-di-pareto)).

The matrix initially proposed was, therefore, complemented by adding values that indicated the importance of each goal. This importance has been associated with a numerical value on a scale from 1 to 5 (1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high). In addition it was decided to define how each indicator was pursuing the objectives, in relation to the topic under consideration, through symbols. Therefore the indicators can represent a strong (●), moderate (□) or weak (◇) objective. The coding of these three symbols is:

- ◇ = 1;
- □ = 3;
- ● = 5.

An array is obtained where along the x axis is the set of indicators taken into consideration and the objectives to be pursued along the y-axis. Through the mathematical operations you will arrive at the definition of absolute weight for each indicator, whose maximum is 130, and the relative weighting, calculated in relation to the sum of the Absolute values of the weights of the individual indicators (Fig. 6).

Using the information in the matrix it was possible, starting with the importance attributed to the objectives, to determine a scale of priority indicators. The absolute weight of the indicators was obtained by the sum of the products between the degree of importance of each objective and the value to which the indicator represents the goal itself.

$$K_j = \sum_{i=1}^m d_i * v_{ij}$$

Where K_j is the absolute weight of the indicator j-th (j ranges from 1 to n); n is the number of indicators; d_i is the degree of importance of the objective i-th, 3 =, 4.5; v_{ij} is the value that describes how the indicator aims, $v_{ij} = 1, 3.5$; m is the number of goals.

The relative weight with which to construct the cumulative curve can also be obtained by calculating the formula:

$$K_j^* = \frac{K_j}{\sum_{j=1}^n K_j}$$

Where K_j^* is the relative weight of the j-th marker; K_j is the absolute weight of the indicator j-th; n is the number of indicators;

Looking at the chart below it may happen that, for example, the indicators that may help to describe 80% of the targets are numerous. Since it is known that the fewer indicators used in monitoring the greater the reliability, it has been decided to further reduce that number by choosing those indicators that turn out to have greater absolute weight, identified either by the height of the bars that make up the histogram, both from the increased slope of the line that represents the trend of cumulative percentages (Fig. 7).

The choice of indicators in the Material and Physical Category (CRFE), inherent to the themes of Building Heritage (both private and public) and Advancement of Expenditure, derives from the analysis of the data used for the Reconstruction monitoring proposed both by the Civil Protection and by the Special Offices for Reconstruction. As far as the thematic of the Socio-Economic System is concerned, the selection was carried out starting from both the analysis of the data used for monitoring the Reconstruction proposed by the Civil

Protection and the Special Reconstruction Offices, and the use of the Istat databases for the analysis and interpretation of economic and social phenomena.

SOCIO – ECONOMIC SYSTEM										
OBJECTIVES	IMPORTANCE	INDICATORS								
		Practices presented Funding request	Construction Site	Completed Interventions	Per capita allocations of funds	Per capita funding	Per capita supply	Population return	Annual change of construction activities	Migration rate
Responsiveness	5	◇	◇	□	◇	◇	◇	●	●	●
Trasparency	5	◇	◇	◇	◇	◇	□	●	□	□
Timeliness	5	◇	◇	□	◇	◇	◇	●	□	●
Certificate(internal consistency)	4	□	◇	□	◇	◇	◇	●	●	●
Resillience	4	◇	◇	◇	◇	◇	◇	●	●	●
Realiability	3	◇	◇	◇	□	□	□	●	●	●
ABSOLUTE WEIGHT		34	26	60	32	32	42	130	110	120
RELATIVE WEIGHT % respect to the sum of the maximum absolute values		9%	4%	4%	20%	18%	20%	4%	11%	10%

Fig. 6 'Matrix of relations' relating to socio – economic system

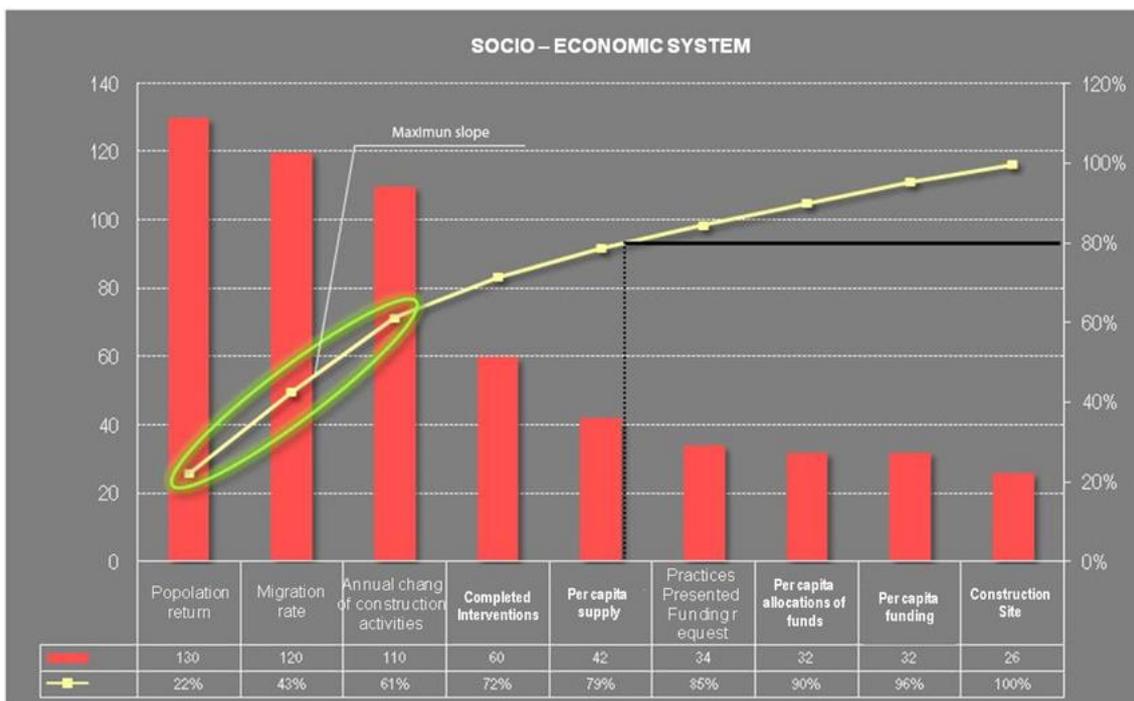


Fig. 7 Pareto histogram relating to socio-economic system

However, in the case of the Immaterial Category, in order to define the indicators, on the one hand an analysis of the Istat databases was carried out for the interpretation of demographic, economic and social phenomena, and on the other hand a study on the Bes Report proposed by Istat (which illustrates the 12 domains relevant to the measurement of social well-being) was used.

The indicators have the following characteristics:

- relevance, i.e. they are the most appropriate to describe the phenomenon;
- practicality, i.e. they are easy to set up and easy to use. They Must constitute a good basis of communication that is accessible to all;
- economicity, i.e. they are not expensive to recover.

Moreover, as regards their units, they will be:

- numerical (eg. Number of practices presented, working population);
- percentage or rate;
- report.

This leads to define the following set of indicators, described in Tabl. 2-7.

Code	Name	Type	Description	Value
(1.1. FE)	Practices presented or funding requests	STATE	The indicator describes the State of the Art by identifying the number or percentage of the practices presented (Private Reconstruction) and tenders financed (Public Reconstruction).	Number and/or %
(1.2. FE)	Construction sites	PRESSURE	The indicator identifies the number or percentage of open sites (public and private Reconstruction).	Number and/or %
(1.3. FE)	Interventions Completed	RESPONSES	The indicator identifies the response of the process by the number or percentage of operations concluded (private and public Reconstruction).	Number and/or %

Tab. 2 Material category, indicators relating to heritage buildings (Private and public) - CRFE

Code	Name	Type	Description	Value
(2.1.FE)	Allocation of funds per inhabitant	PRESSURE	The indicator describes the advancement of day-to-day expenditure (funding)	€/inhabitant
(2.2 FE.)	Per capita financing	STATE	The indicator describes the State of the Art through the relationship euro/inhabitant (Euro financing)	€/inhabitant
(2.3 FE.)	Per capita supply	RESPONSES	The indicator identifies the response of the process by the value of the money spent.	€/inhabitant

Tab. 3 Material category, indicators relating to shopping feed – CRFE

Code	Name	Type	Description	Value
(3.1.FE)	Population return	RESPONSES	The indicator identifies the response of the process by the number or percentage of the population that has returned to home.	Number and/or %
(3.2.FE.)	Annual change of construction activities	STATE	The indicator describes the State of the Art by locating the building contractors.	%
(3.3.FE.)	Migration rate	STATE	This indicator describes the level of migratory changes per year. It is obtained from the ratio of annual migrations recorded and the resident population.	%

Tab. 4 Material category, indicators relating to socio-economic system - CRFE

Code	Name	Type	Description	Value
(1.1. PE)	Demographic Balance	RESPONSES	The indicator serves to represent the natural balance and net migration rate.	Number and/or %
(1.2. PE)	Active Population	STATE	The part of the population, aged between 15 and 64 years, capable of performing an occupation.	Number and/or %
(1.3. PE)	School-age population	STATE	Population subject to compulsory education.	Number and/or %

Tab. 5 Intangible category, indicators relating to demographic attractiveness – CRPE

Code	Name	Type	Description	Value
(2.1. PE)	Unemployment rate	RESPONSES	Measures the percentage of the workforce who cannot find work	%
(2.2. PE)	Average income per capita	STATE	This is the amount of gross domestic product on average possessed, over a period of time by a single person.	€/year
(2.3. PE)	Annual change of listings	STATE	The indicator describes the State of the art by locating the annual percentage variation of the activities	%

Tab. 6 Intangible category, indicators relating to economic dynamism - CRPE

Code	Name	Type	Description	Value
(3.1. PE)	Rate of theft and robbery	RESPONSES	The indicator locates the number or percentage of burglaries in homes and the robberies.	Number and/or %
(3.2. PE)	Level Associations	PRESSURE	Per capita public expenditure allocated to the indicator describes the management of cultural heritage	%
(3.3. PE)	Psychological rate	STATE	Percentage of the population suffering from psychological disorders after an earthquake.	Number and/or %

Tab. 7 Intangible category, indicators relating to social welfare - CRPE

4.2 THE APPLICATION OF THE MODEL TO THE CASE STUDY: A LESSON TO REMEMBER

By monitoring and analyzing the State of affairs it was possible to observe what worked and what did not work in the process of rebuilding, a process that is still underway in the city studied.

Measuring the level of recreating a generic territory hit by a disaster is a complex. The main difficulty lies in the multidimensional character of the phenomenon, the measurement of which requests, initially, the overcoming of obstacles of a conceptual nature related to the peculiarities of the phenomenon. In this case it is oriented towards the construction of a synthetic measure that, through an appropriate aggregation function, is able to capture the many facets of the phenomenon under study, as described by the Set of Indicators identified. It is believed that the primary indicator system, nonetheless provides comprehensive and complete information can not be read easily because of the multidimensionality of the phenomenon under observation. The Set of Indicators needs to provide a unique quantification (one-dimensional) which collects all the information, so that it is readily visible and interpretable. This quantification is called Synthetic Index (Fig. 8 and 9). This is why the observation of the phenomenon is simplified. It was decided to associate to the Synthetic Index a tool that would allow a visual comprehension of the progress of reconstruction. This tool is the Radar Chart, which can display multiple series of data simultaneously, allowing an immediate comparison among them (Fig. 10). Therefore, the method illustrated is able to provide a measure of resilience directly related to the values expressed by each individual indicator and even more clearly by the Synthetic Index.

The data obtained in 2015 from monitoring carried out shows a slow but still favorable enabling of the Physical Reconstruction (index CRFE 60% for the city of L'Aquila, including reconstruction data both private and public), proving that the improvements and simplifications introduced with the new Governance were necessary. We see that the Reconstruction of the Building Heritage, both private and public, is now proceeding at a sufficient rate and that for almost all the buildings for which an application for contribution has been made, the practicability permits have been reconfirmed or the site is in operation. This trend is confirmed by observing the progress of the expenditure. It should be noted, however, that private reconstruction has a faster trend than public reconstruction. The thematism of the socio-economic system, always linked to the Category of Physical Reconstruction, is what indicates an unsatisfactory trend. First of all, we observe that it is not possible to have the data concerning the "Returned Population". This is because the Municipality does not carry out monitoring in this sense. This lack is to be considered serious in a catastrophe like this that hit a city populated by 73,203 people in 2009 (source CRESA), all of whom were considered as evacuees in the emergency phase. We can say that strategic co-planning of the territory affected by the earthquake is still lacking. In terms of institutional issues there has been a lack of coordination between the various levels of public administration. The proliferation of actors involved in the "earthquake issue" was the cause of incomplete and partial decisions,

making the process of reconstructing fragmented and not organic. The political fragmentation gave rise to the inability to locate and manage coherently the challenges posed by the earthquake. This fragmentation of the standard made the rehabilitation processes complex and difficult to understand. This has therefore not led to a shared strategy for long-term recovery. All this resulted in the substantial failure of the local administration, especially with respect to its chief town, in assuming the decision-making and coordination role that is proper to it. These considerations are confirmed in the values of Intangible Reconstruction (index CRPE 42,2% for the city of L'Aquila).

OBJECTIVES	IMPORTANCE	HERITAGE BUILDING			SHOPPING FEED			SOCIO – ECONOMIC SYSTEM		
		Practices presented	Construction Site	Completed Interventions	Allocations of funds per capita	Per capita funding	Per capita supply	Population return	Annual change of construction activities	Migration rate
Responsiveness	5	□	●	□	□	●	□	◇	□	◇
Transparency	5	□	●	□	□	●	□	◇	□	◇
Timeliness	5	□	●	□	□	●	□	◇	□	◇
Certificate (internal consistency)	4	□	●	□	□	●	□	◇	□	◇
Resilience	4	□	●	□	□	●	□	◇	□	◇
Reliability	3	□	●	□	□	●	□	◇	□	◇
ABSOLUTE WEIGHT		78	130	78	78	130	78	26	78	26
RELATIVE WEIGHT % compared to the maximum reachable		60,0%	100,0%	60,0%	60,0%	100,0%	60,0%	20,0%	60,0%	20,0%
RELATIVE WEIGHT % respect to the sum of the maximum absolute values		6,7%	11,1%	6,7%	6,7%	11,1%	6,7%	2,2%	6,7%	2,2%
PHYSICAL RECONSTRUCTIVE CAPACITY EXPRESSED CRFE - SYNTHETIC INDEX								60,0%		

Fig. 8 Synthetic Index relating to Physical Reconstruction

OBJECTIVES	IMPORTANCE	DEMOGRAPHIC ATTRACTIVENESS			ECONOMIC DYNAMISM			SOCIAL WELFARE		
		Demographic Balance	Active Population	School – age population	Unemployment rate	Average income per capita	Annual change of listings	Rate of theft and robbery	Level/Associations	Psychologic rate
Responsiveness	5	◇	□	◇	□	●	◇	◇	□	□
Transparency	5	◇	□	◇	□	●	◇	◇	□	□
Timeliness	5	◇	□	◇	□	●	◇	◇	□	□
Certificate (internal consistency)	4	◇	□	◇	□	●	◇	◇	□	□
Resilience	4	◇	□	◇	□	●	◇	◇	□	□
Reliability	3	◇	□	◇	□	●	◇	◇	□	□
ABSOLUTE WEIGHT		26	78	26	78	130	26	26	78	78
RELATIVE WEIGHT % compared to the maximum reachable		20,0%	60,0%	20,0%	60,0%	100,0%	20,0%	20,0%	60,0%	60,0%
RELATIVE WEIGHT % respect to the sum of the maximum absolute values		2,2%	6,7%	2,2%	6,7%	11,1%	2,2%	2,2%	2,2%	6,7%
EXPERT PERFORMANCE RECONSTRUCTIVE CAPACITY CRPE - SYNTHETIC INDEX								42,2%		

Fig. 9 Synthetic Index relating to Intangible Reconstruction

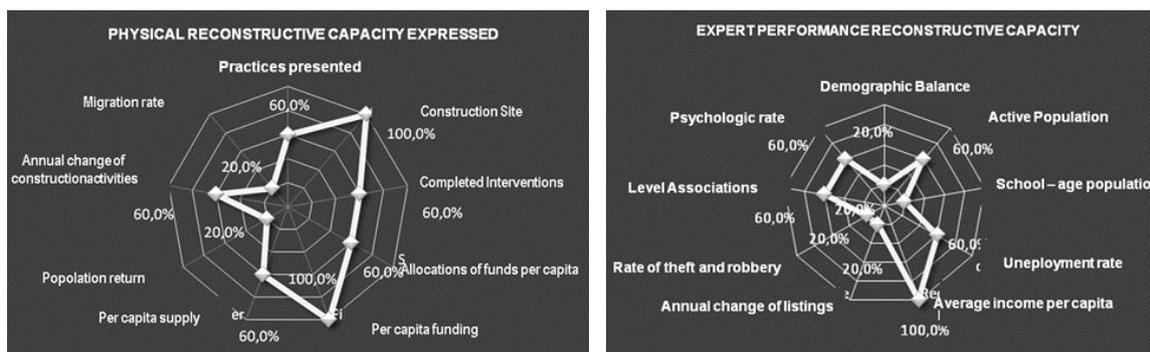


Fig. 10 Radar Chart: (a) Material Category – CRFE (left) ; (b) Intangible Category – CRPE (right)

5. TOPICS OF DISCUSSION

The strengthening of the resilience of the territories frequently affected by natural disasters is essential for a sustainable development strategy; this strengthening would achieve increasingly high performance standards through the rapid urban and landscape transformations associated with these special contexts. The resilience of an area depends to a large extent on the responsiveness of individuals, who must be able to conceive and implement adaptation measures (OECD, 2013). At the same time, the role of public administrations in the socio-economic recovery of a territory affected is crucial due to the choices that are applied and the objectives pursued with development policies. For this reason, following a consistent and organized methodology through forecasting models of the strategic objectives that can lead the territories to recovery is especially important in areas exposed to natural disasters. At the same time, irrespective of the occurrence of the disaster, equipping the administrations with a tool that can manage and overcome any future shocks, means improving the endurance and adaptability of a territory. "International experiences indicate a good metric of expected results from a development strategy (...will serve not only to monitor progress towards these results, but to allow changes, increase accountability and motivate citizens and policies" (OECD, 2013). The natural disaster impacts the disaster area, by destroying the physical capital and the social fabric. Improving the response to risk of the area affected, means to create precisely place-based policies (local development). Place-based policy aimed at implementing development strategies and respondents meet local objectives and needs identified, discussed and implemented in cooperation with the actors of the place. It is a cohesion policy and is associated with the recognition of the added value from the analysis of endogenous potentials and needs. In practice this results in the formulation of local development strategies. For this reason, the choice of indicators cannot be separated from the territory affected, as demonstrated by the case study presented in this work. In the experience of the city of L'Aquila, the diagnostic method of reconstruction process applied, can be seen as a prototype for future cases of reconstruction after disasters. In fact, thanks to the set of indicators, it was possible to understand what the Reconstruction Process involves in both positive and negative terms. What emerged was that the Italian government's policy regarding the immediate response to the disaster was to guarantee an indiscriminate convergence of large amounts of human and financial resources. The Achilles' heel of the post-disaster emergency management in Italy, and therefore also in L'Aquila, is the inability to complete the system by fully articulating the planning resources for emergencies and their management. The national guidelines for these processes are excessively complex, out of date and not in step with the times. One year after the earthquake the historic centers of the affected towns were still off limits. Another two years passed in "Gestione Commissariale" (L.77/2009), which lengthened the times and slowed down the Reconstruction itself, so much so that we talk about the end of the emergency phase only in 2012 (L.134/2012), with the takeover of ordinary management and the establishment of two Reconstruction Offices (USRA and USRC). It is thanks to this bureaucratic reduction that the reconstruction has finally gained

momentum. From a demographic and settlement point of view, however, all this has resulted in a demographic decline due to changes of residence with the consequent decrease in the school-age population. Furthermore, the slow recovery of reconstruction has generated the difficulties for small and medium enterprises and an increase in unemployment. The efficiency of the model lies in the evaluation of all dimensions of the system - physical, economic and social - at the moment of choosing the means of intervention for the recovery of the territory. There are various lessons that we can learn, as results from the application of the case study; the most significant is that of having to predict a system of strategic planning which from the very beginning will guide and shape the process of reconstruction, looking at both the physical reconstruction and the socio-economic development of local realities. For this reason it was decided to integrate the indicators of Socio-Economic System (CRFE) and social welfare (CRPE) used for the monitoring of L'Aquila with those updated by Istat for BES ⁵(Istat,2018), as shown in Tab. 8-11. The indicators of the BES (Fair and Sustainable Wellness) have been developed by ISTAT and CNEL, to assess the progress of a society not only from an economic but also from a social and environmental point of view, taking into account measures of inequality and sustainability also.

Code	Name	Type	Description	Value
(3.1.FE.)	Population return	RESPONSES	The indicator identifies the response of the process by the number or percentage of the population that has returned to home.	Number and/or%
(3.2, FE.)	Mobility of Graduates	PRESSURE	This indicator describes the response of the system according to the attractiveness of graduates.	%
(3.3. FE.)	Migration rate	STATE	This indicator describes the level of migratory changes per year. Is obtained from the ratio of annual migrations recorded and the resident population.	%

Tab. 8 Material category, indicators relating to socio-economic system a) - CRFE

Code	Name	Type	Description	Value
(3.4.FE.)	Investments in intellectual property	PRESSURE	The indicator describes the per capita public expenditure on research and development, software and databases, entertainment, literary or artistic works and other intellectual property products	€/inhabitant
(3.5, FE.)	Annual change of construction activities	STATE	The indicator describes the State of the Art by locating the building contractors.	%
(3.6. FE.)	Spending on cultural heritage management	PRESSURE	Per capita public expenditure allocated to the indicator describes the management of cultural heritage.	€/inhabitant

Tab. 9 Material category, indicators relating to socio-economic system b) - CRFE

⁵ BES (Fair and sustainable welfare) is an index develops, by Istat and CNEL, to evaluate the progress of a society not only from an economic but also social and environmental point of view.

Code	Name	Type	Description	Value
(3.1. PE)	Rate of theft and robbery	RESPONSES	Indicator locates the number or percentage of burglaries in homes and the robberies.	Number and/or %
(3.2. PE)	Physical and sexual violence	STATE	Indicator locates the number or percentage of acts of physical and sexual violence	Number and/or %
(3.3. PE)	Dissatisfaction with the landscape and the city	STATE	Percentage of the population unhappy with the place where they live	Number and/or %

Tab. 10 Intangible category, indicators relating to social welfare a) - CRPE

Code	Name	Type	Description	Value
(3.4. PE)	Air quality	STATE	Indicator locates of air quality.	Number and/or %
(3.5. PE)	Difficult access to certain services	STATE	The indicator describes the State of the Art by identifying the difficulty of access to certain services	%
(3.6. PE)	Time dedicated to mobility	RESPONSES	Percentage of time that the population uses in moving.	%

Tab. 11 Intangible category, indicators relating to social welfare b) - CRPE

Although the proposed method has various strengths, there are also weaknesses. It is, in fact, a non-autonomous process with regard to the schematization of the data. It is possible to link the indicators, and therefore the open data associated, with a GIS environment. In this way, thanks to the use of plugins, not native but designed ad-hoc, it would be possible to view, store and extrapolate the results directly from the software. This would allow to manage the entire process through ICT dynamic control tools.

5.1 FUTURE RESEARCH DEVELOPMENTS

The Reconstruction Process is a theme that embraces various sectors, public and private, material and immaterial, economic and social. It constitutes a different perspective with which to look at the city and its government, referring to the various areas of planning and using what is called an integrated approach. The integrated approach implies the need to simultaneously face all the multiple aspects that concern the Urban Governance of the Reconstruction, in a sort of overall strategy within which to develop policies and management interventions coherently and integrally. For this reason, the fundamental role is played by the strategic planning activities, which must intervene on the multiple aspects of the Reconstruction itself, by working not only on the design choices, but also on the construction of cognitive frameworks and indicators. Consequently we can say that monitoring becomes an integral part of the Reconstruction Process, making it acquire the character of circularity: from the framework of shared knowledge, decisions are determined whose consistency and compatibility is established through evaluation (ex ante evaluation) and through the monitoring of the implementation of decisions. In this way the two phases (evaluation and monitoring) are never really considered completed, being in constant revision. Beginning with the method suggested, this paper proposes the drafting of guidelines that can address the strategic lines of public administration so as to

guide urban transformations according to the optimization models resilience of an area. The general structure of the guidelines will follow the circular pattern proposed in Fig. 11: response and pressure indicators serve both to the definition for the control and, if necessary, for a subsequent redefinition of the strategic guidelines and proposed actions, while those of State are used only to monitor the situation at the time t. It should be noted that one policy does not exclude another, but are complementary and integrated. The reconstruction process can be governed by the Guide-Lines, taking in to the consideration the necessities for a socio-economic development, such as the environmental and the social and economic emancipation. Actions and interventions studied with the above Strategic Lines in mind, could be revealed as tools for overcoming administrative obstacles and to allow missing connections to converge. In this way will become more transparent and participatory. The Public Administrations will thus be able to obtain a wider range of objective elements and input before taking their respective decisions.

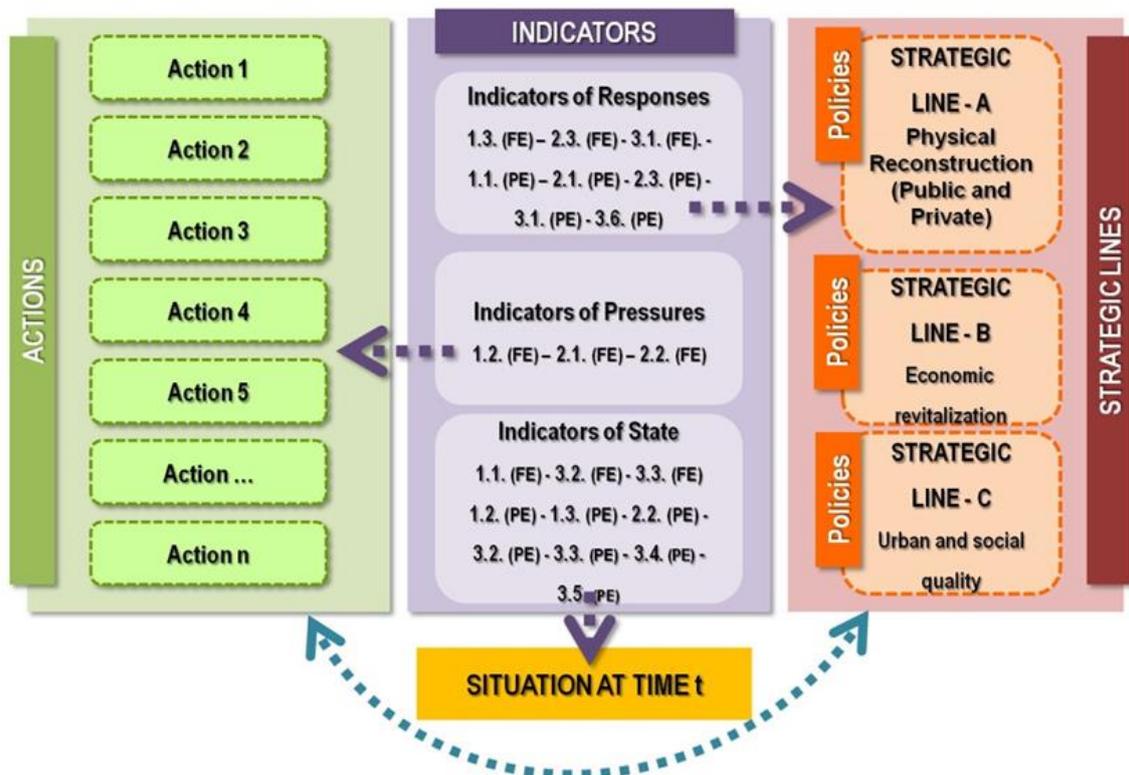


Fig. 11 Schematization of the guidelines structure proposed

6. CONCLUSION

The work aims at proposing a replicable method to define a set of indicators able to guide and monitor the transformation process of a territory affected by a natural disaster. The issues dealt with regard the extent to which an affected territory manages to use the traumatic event as a starting point for recovering from the critical issues by relying on the existing local potential. The L'Aquila earthquake was a medium-power seismic event which, however, caused a great deal of damage. The management of the Reconstruction process has been tackled by Italian government policy in a way that is not always optimal. The earthquake has accelerated the economic stagnation phases producing greater uncertainty about the future. It is on events of this magnitude that the research must concentrate, because they are more and more frequent and without certain and defined guidelines regarding their management in the post-emergence phase. The resilience of a territory, following a disaster, lies in the ability to withstand and respond to shock, through processes that are able to use the urban and territorial framework, the system of share knowledge and adaptive governance processes. These must ensure retrieval of performance level needed to begin now development processes. The essential

sustaining element for the Reconstruction Process is the Set of Indicators. This is necessary, as has been seen, for guiding a serious Public Policy and for quantifying the level of response of areas exposed to natural disasters, whose unexpected occurrence may require a new set of development management models. The possibility of using resilience through indicators that provide reliable results would equip public administrations with tools able to guide the strategic choices for local development, reaching the desired level of territory and urban resilience with the aim of guaranteeing their long-term wellbeing. It can therefore be affirmed that the strategic lines, the policies and the actions that are proposed are able to express as a whole a strategic order and a will to transform reality in a participated and shared way.

Author Contributions: F.P. designed the research, wrote Sections 3 and 4, performed the analyses, produced tables, schemes and results, wrote Section 5 and 6 with M.D.V.; M.D.V. designed the paper and wrote section 1 and 2; P.P. supervised the research and the paper.

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AUTHOR'S PROFILE

Federica Pignatelli is an engineering, she graduated with a special mention "Thesis worthy of publication" from the University of L'Aquila, where she also obtained a PhD in April 2016. Her thesis discussed the "Performance diagnostics of the process of reconstruction". In the months of May and June 2009 she carried out voluntary work at the Civil Protection following the 2009 earthquake. She was a member of the LAURAQ as operative secretary - L'Aquila Urban Planning Laboratory. From 2011 to 2016 she carried out activities of teaching support in the Course of Urban Planning Technique I and in the Course of Urban Planning at the University of L'Aquila. She became treasurer of the Abruzzo-Molise division of the National Institute of Urban Planning (INU) in 2013. She became Territorial Representative within the division council in 2016. She is the author of several publications and participations as a speaker in seminars. Currently she is a freelancer working in urban and architectural reconstruction. As from the 2009 earthquake she has carried out assignments and collaborations with several institutions both in the field of building design and in urban planning.

Mariangela De Vita is an engineering, she graduated with full marks and honours from the University of L'Aquila where she also obtained a PhD in July 2017 with a thesis on the performance evaluation of technical textiles applied to architecture. From 2016 she has collaborated with the Construction Technologies Institute (ITC), a scientific facility of the National Research Council of Italy (CNR), and since May 2018 has held a post doc research fellow at the same institute. She is the winner of numerous research grants, including funding received from the Abruzzo Region for AI.fo. and ERBOR_AQ projects. She has taken part in numerous design workshops on the theme of lightweight, parametric and sustainable architecture. From 2014 to 2015 she collaborated with the Dunamis design studio. Her research activity is oriented towards analysis and design retrofit interventions on Cultural Heritage with the aim of evaluating and optimizing compatible and more efficient solutions both in terms of energy performance and environmental comfort. The aspects related to the preservation and enhancement of the natural resilience of landscapes, places and buildings of the protected heritage plays a fundamental role in her studies.

Pierluigi Properzi is an Architect, he was full professor of Urban Planning Technique at the University of L'Aquila and general secretary of the INU - National Urban Planning Institute. He has coordinated research groups on the evolution of the national planning system (Quater) and of the regional legislative frameworks; he edited the first Report on the state of Planning on behalf of the Ministry of Public Works and participated in the ANPA research on guidelines for national ecological networks. He has been a member of the Governing Council of the Italian Association of Regional Sciences AISRE (1997-2000) and a member of the Scientific Committee of the Regional Center of Economic Studies and Social Research CRESA since 1999. He directs the AnTeA Laboratory (Territorial and Environmental Analysis) of the Architecture and Urban Planning Department and is the Scientific Director of the INU / ANCSA Laboratory for the Reconstruction of the city of L'Aquila. He has worked as a consultant for the National Public Authority (Min. LLPP - ANAS) and Regional Public Authority (Abruzzo Region - Basilicata - Molise - Friuli VG - Umbria - Autonomous Province of Trento) and has coordinated Working Groups for the formation of Framework Plans and Regional Laws. He has also drafted numerous regulatory plans for medium-sized cities and various urban strategic plans and interregional strategic platforms. He is author of over 150 publications and intervenes in the disciplinary debate on the main journals. He is also a member of the Scientific Committee (Urban Planning – Urban Information) of some of these journals. He edited the first Report on the state of planning on behalf of the Ministry of Public Works / 2001.

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GREEN IS THE COLOUR

STANDARDS, EQUIPMENT AND PUBLIC SPACE AS PARADIGM FOR THE ITALIAN SUSTAINABLE CITY

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ABSTRACT

The speed of the urban systems is related with a series of social, economic, and environmental transformations bringing often to a critic state that needs the redefinition of urban elements and relationships, in order to guarantee quality and safety to the inhabitants' lives. Related to the new spatial conditions of planning is the topic of urban equipment that is an open matter in the urban politics.

Their relevance for Italian cities made them a symbol of democratization and quality of the cities, due to the obligatory of minimum quantities of spaces for public services. The 50 years from the issue of DM 1444 allows to express a series of evaluations on the role of the public equipment in the processes of urban transformation and governance. Starting from this analysis, the paper proposes adequate and updated solutions in terms of evolution of the standards categories and their quantitative and qualitative characteristics, deepening the role of the urban facilities as potential sources of innovation.

The first part of the paper highlights some elements related to the long period of application of the law, and the results of this application in terms of increase and quality in the urban equipment of the city. The second part explores the motivations behind the need for a comprehensive updating of the subject, referring to concepts such as sustainability, and quality of urban systems. In the third part, starting from new requirements, new needs, new risks affecting urban systems, as well as from critical points of the Italian law structure, the paper proposes new categories of urban planning standards and the related functional requirements they must to satisfy.

KEYWORDS:

DM 1444/1968; Public city; Urban equipment; Standard; Italy

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绿色是主色调。标准、设施和公共空间堪称意大利可持续城市的典范

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摘要

城市系统的发展速度与社会、经济和环境等一系列变化息息相关，这些变化常常伴随着城市元素与诸多关系的重新定义，以保证居民生活的质量与安全。城市设施与规划的全新空间条件相联系，这是城市政治中的一个开放性问题。

受到公共服务空间最少数量的限制，意大利城市设施成为城市民主化与生活品质的象征。自发布以来的50年里，DM 1444对公共设施在城市转型和管理过程中发挥的作用进行一系列评估。从这一分析结果出发，本文就标准类别的演变及其定量和定性方面的特征提出了最新合理解决方案，不断深化城市设施作为潜在创新来源的作用。本文第一部分重点介绍了与适用时间长的法律相关的部分要素，以及该法律的运用在增加城市设施与提升其质量方面取得的成果。第二部分探讨了不断扩大改善城市设施需要的动机，涉及可持续性、城市系统质量等概念。第三部分，从新要求、新需求、影响城市系统的新风险以及意大利法律结构的关键问题出发，本文提出了城市规划标准新分类方法及其必须满足的相关功能要求。

关键词:

DM 1444/1968; 城市; 城市设施; 标准; 意大利

1 INTRODUCTION

In the last decades, urban systems have been dealing with a series of new challenges due to economic, social and environmental issues.

The 2008 economic and financial crisis had impacts on the world of real estate business, on public and corporate housing policies, and on large-scale urban development projects in metropolitan city regions (Bauman & Bordoni, 2014; Harvey, 2012; Kunzmann, 2016). The entity of these effects was obviously different, depending on the territorial contexts (and therefore the relative response capacities). However, in general, the economic recession amplified the already inherent complexity of the governance's processes of urban and territorial transformations (Donald & Gray, 2013; Fregolent & Savino, 2014). In Italy, in particular, we register a fall in investments in connection with the reduction of trade in the construction sector that has contributed to slowing down the urban growth trends (ANCE, 2014; Bank of Italy, 2014).

The differentiation in the growth of urban population – due to new social scenarios and technological innovations – has provoked the emergence on new needs and aspirations calling an answer by the cities.

Just think of the structure of the population in developed countries, characterized by an increasing presence of elderly people and by the decrease in the younger population, with a consequent increase of old age and dependence indices that, in Italy, are among the highest in Europe (Eurostat, 2016). This scenario requires new forms of governance with the aim to increase the quality of life of elderly (Battarra et al., 2018; Gargiulo et al., 2018).

From a spatial and environmental point of view, cities are testing more and more the effects of climate change and soil sealing, two phenomena connected by an one-to-one relationship requiring changes of space form and use both at city and architecture levels (Blanco et al., 2011; De Gregorio Hurtado et al., 2015; Mazzeo, 2012; Zucaro & Morosini, 2018).

The speed with which these problems invest the urban systems and the multiplication of their effects, is mostly incompatible with the speed of transformation (and adaptation) of activities and spaces. This gap can be traced back to the rigid system of land use rules still characterizing traditional urban planning. The associated structural crisis of the urban systems needs the redefinition of their elements and relationships, with the identification of new ways of organizing and managing the urban system in order to guarantee quality and safety to the inhabitants' lives (Gargiulo et al., 2017; Papa, 2018).

Related to these new spatial conditions of planning is the topic of urban equipment that is an open matter in the urban politics, even for Italian cities. Their relevance in the Twentieth century urban landscape made them a symbol of democratization and quality of the cities (Astengo, 1967; Wilensky, 1975), due to the obligatory of minimum quantities of spaces for public services below which urban livability cannot be considered to be satisfied (Caldarice, 2018).

On April 2, 1968, Ministerial Decree (from now, DM) no. 1444 of 1968 was issued. It represents a unique in the evolution of the Italian planning laws because it is characterized by the identification of specific public equipment whose provision within the urban plans becomes mandatory and is quantified according to specific dimensional values (Falco, 1978). The mandatory nature and clarity of the formulation has made this law one of the most applied in the planning field and a reference point in the administrative litigation.

Inside the residential settlements, the "maximum ratio" are measured in 18 square meter for inhabitant. These spaces are devoted to public services, to mass activities, to public green, and to parking lots. The spaces for the streets are excluded by the measure. The value of 18 square meter for inhabitant is a minimum imperative quantity and it is "normally" composed by four categories:

- 4.50 square meter of areas for schooling, in particular nurseries, kindergartens and primary schools;
- 2.00 square meter of areas for common interest activities, i.e. religious, cultural, social, welfare, health, administrative, public services (Post and Telecommunication offices, civil protection, etc.) and other;

- 9.00 square meter of public spaces equipped as green park and areas for the game and sport effectively available for such installations. Of these spaces are not part the green bands along the roads;
- 2.50 square meter of parking areas that, in specific cases, can be distributed on different levels. They are added to the parking areas provided for by article 18 of the Law 765 of 1967.

Article 5 of the DM 1444 defines also the maximum ratios between the spaces designed to productive settlements and public spaces designed to collective activities, public parks or parking areas.

Although the standards required for production areas facilities are not subject of study in this paper, it is worthwhile to make some considerations in this regard.

For these areas can be hypothesised specific indications, for example, for the parking areas, because they are often very extensive, as in areas designed to the great shopping centre, for the green areas and for the control of the soil quality. This last aspect is fundamental if potentially dangerous or harmful activities for the quality of the soil and subsoil are presents.

Tab. 1 shows a list of public equipment and the corresponding category, according to the Italian legislation. The issue of urban planning standards has to be placed in a more general reasoning affecting the urban infrastructures. In fact, they are subjected to increasing pressures such that to require a systemic answer affecting all the elements making up the public city.

	Urban planning standard (1)	General interest equipment (1)	Primary urbanization works	Secondary urbanization works	Infrastructures
Residential street			Y		
Cycle and pedestrian paths			Y		
Technological networks			Y		
Public lighting			Y		
Communication networks			Y		
Nursery schools	Y			Y	
Primary schools	Y			Y	
Secondary schools		Y		Y	
Neighborhood markets	Y			Y	
Municipal delegations	Y			Y	
Churches, religious buildings	Y	Y		Y	
Social centers	Y			Y	
Cultural facilities	Y	Y		Y	
Equipped public green	Y		Y		
Neighbour. sports facilities	Y			Y	
Green parks		Y			
Car rest areas	Y		Y		
Parking		Y		Y	
Sanitary equipment	Y	Y		Y	Y
Security equipment	Y	Y		Y	Y
Urban waste plants				Y	
University and research		Y			Y
Great communication roads					Y
Railways, ports, airports					Y
Energy networks					Y

Tab. 1 Classification of urban and territorial public equipment. (1) Standard and equipment contained in DM 1444/1968¹.

¹ The urban plan, among other tasks, identifies and delimits the “urban planning standard” and the “equipment of general interest”. When we move on to the implementation phase we talk about “primary urbanization works” and “secondary

50 years have passed since the issue of DM 1444; it is a period of time that allows to express a series of evaluations on the role of the public equipment in the processes of urban transformation and governance.

In this perspective, the present paper proposes adequate and updated solutions in terms of evolution of the standards categories and their quantitative and qualitative characteristics. It is appropriate to deepen the role of the urban facilities as potential sources of innovation, starting from new requirements, new needs, new risks affecting urban systems, as well as from critical points of the Italian law structure introducing them.

The paper is formed by three parts.

The first part highlights some elements related to the long period of application of the law. It analyses the results of this application in terms of increase and quality in the urban equipment of the city. The second part explores the motivations behind the need for a comprehensive updating of the subject, referring to concepts such as sustainability, and the quality of urban systems. In the third part, finally, the paper proposes new categories of urban planning standards and the related functional requirements they must to satisfy.

This articulation shows, in practice, a path in terms of updating of the indications of the DM 1444 and, more in general, of the significance of the public equipment in the city.

2. THE ITALIAN NATIONAL LAW AND ITS IMPLEMENTATION

2.1 IMPLEMENTATION OF THE DM 1444/1968

The application of DM 1444 has changed the way of doing planning in Italy and has made possible the creation of a new type of urban plan, closer to the construction of the public city (Gabellini, 2001; Oliva, 1999; Salzano, 2002). This consideration highlights the significant and positive impact of the law. Indeed, the attention to the retrieval of the standards has become a factor of primary importance in the design of urban plans, like the finding of the urban expansion areas, at least until the plans have been set up with an expansive philosophy. The obligation to find the standards, essential for the approval of the urban plans was, above all, the cause that made possible this result.

The enforcement of a minimum amount of public space derived from the observation that the Italian cities had grown in the second post-war period with the sole objective of maximizing land rent (Camagni, 2012). This led to the forecast and construction of new settlements with little or no public facilities, green spaces, car parks and schools.

The term "urban planning standard" indicates the minimum quantities of public (or for public use) spaces that must be obligatorily quantified and identified in the urban plans. Their implementation is delegated to a subsequent phase and takes the form of a direct intervention by the public administration or through the deployment of detailed plans.

The dimension and distribution of these standards translates, within the municipal plan, in the identification of the areas necessary for their realization and in the imposition of restrictions finalised to their acquisition to the municipal asset. There are three considerations to make.

Primarily, this obligation has had as a straight consequence the strong growth of the public real-estate assets. The counterpart to this outcome was the necessity of binding huge sums of the municipal budget for their acquisition (Mazzeo & Ceudech, 2009).

A second element to consider is related to the fairness of citizens facing the city and the plan, fairness that it is possible to reach also with public equipment that are really usable and whose management is aimed at satisfying the needs of the urban users. This way of approaching the issue should have led to the conclusion that the rights fulfilment does not impose obligatory limit values, but rather identifies mechanisms for a differentiated application according to specific territorial characteristics.

urbanization works". At the territorial level, we use the general term "infrastructure", inserting in this category linear, area and volumetric public works.

This meaning is not even recent. Even before the approval of the *Legge ponte* (Law nr. 765/1967) and of following DM 1444, there was the awareness that public equipment should be a widespread presence within the urban structure and that they should assume characters of high quality, flexibility, and modifiability so that they could maintain unaltered their role and value (Tutino, 1965).

Third point highlights that the application of the DM 1444 must also be seen from the point of view of the “multiplication of legislation” due to the contribution of the regional laws deriving from the application of the provisions of the Italian Constitution. It was implemented after a few decades with the issue of the Decree of the President of Republic nr. 616 of 1977, which carried out the transfer and delegation of a series of administrative functions from the State to the Regions. Starting from the end of Seventies, this transfer has provoked an increasingly extensive fragmentation of the planning legislation due to the implant of regional regulations on the unitary national system. Among the sectors there is also the subject of standards with their differentiation in quantitative, qualitative and applicative terms, from Region to Region (Caceres et al., 2003). On the other hand, the Regional legislations have had the merit of experimenting at local level some elements of innovation deriving from the theoretical insights developed by the town planning schools and by the associations operating in the sector (Istituto Nazionale di Urbanistica, Società Italiana degli Urbanisti and so on). Among these, we can remember the concept of performance (see section 3.2) or the establishment of the municipal and territorial service’s plans (Gerundo & Graziuso, 2014; Paolillo, 2007).

Presidential Decree 380/2001 (Consolidated text of laws and regulations on building) in Article 2-bis, (Derogations on the limits of distance between buildings) reaffirms that the rules on the right of ownership are the responsibility of the State. It establishes also that the Regions can provide exceptions to DM 1444/1968 with «own rules on spaces intended for residential settlements, productive plants, collective activities, green areas and parking areas, as part of the setting or revision of urban plans destined to an overall and unitary development or to specific territorial areas».

Among the other, this possibility was taken up by the Emilia Romagna Region, which in 2017 issued the new regional urban planning law (from now, LR). LR 24 “Regional regulation on the protection and use of territory” provides, in fact, a specific definition of «differentiated urban standards» (article 9).

In particular, the Region, with a specific rule of procedures, establishes «provisions regarding the system of territorial equipment, infrastructures and public services that contribute to achieving the minimum standard of urban and ecological-environmental quality to be guaranteed throughout the regional territory. The technical rule of procedure differentiates the services to be implemented in the urbanized territory compared to the requirements for new settlements, with the aim of promoting urban re-use and regeneration interventions». This differentiation takes place according to a series of principles tending to favour the regeneration activities compared to those producing new consumption of soil, the reduction of which, by the way, is another of the cornerstones of this regional law.

Among the principles, the following are particularly interesting:

- the preservation of the current overall share of public areas for services;
- the primarily allocation of the public areas to meet the needs for new equipment or to modernize the existing ones;
- the possibility of allocating the areas in which no equipment must be created for the realization of social housing with the private participation or the completion of the regeneration and reuse interventions. This is possible only after verification of the satisfaction of existing or forecast equipment in the area;
- the permeable areas within the urbanized territory are destined to ecological and environmental equipment and to the maintenance of the green wedges;
- the derogation to the density and height limits in the operations of urban densification or substitution;
- the possibility of identifying areas of the urbanized territory in which the urban renewal, densification and substitution interventions can lead to the assignment of lower areas for territorial equipment than

those established by DM 1444. This is possible if they are otherwise satisfied within the area, in surrounding areas, in areas accessible through protected cycle paths or by public transport;

- the reduction of the use of the private car and the associated reduction of the parking areas, both public (from standard) and private (internal to buildings) in the urbanized areas with high sustainable accessibility, in which are planned reuse and regeneration interventions. Part of the parking standard ratio can be transferred in private buildings. These forecasts can also be applied to new urbanizations;
- the compensation measures, environmental and territorial rebalancing measures, and ecological equipment cannot reduce the construction contribution and cannot be monetised.

A last account to do is the possibility that the standards defined by Ministerial Decree 1444/68 might also be implemented under a convention between the public administration and a private entity. In this case, we talk about the affixation of a “conformation constraint” (Urbani, 2014).

This type of constraint, unlike the “expropriation constraint”, does not involve a loss of ownership of the land, but only a reduction of its availability in relation to the presence of higher-level objectives of public interest (for example a landscape constraint) or in relation to the conclusion of an agreement allocating a property to a public use.

In this way, a relationship is established between public and private, for which the former specifies the destination of an area to public use equipment and the second remains the ownership of the property and its management. Public use is implemented by means of the provisions contained in the agreement. They force the private entity to specific conditions in the way the equipment is managed.

2.2 OUTCOMES

The need to threat an important section of the plan for the recognition of public equipment, with the aim of defining its size and distribution, as we can see in the case of Florence shown in Fig. 1, has had as primary outcome the growing of the ground stock belonging to the public land patrimony.

However, this process has had significant costs for the local authority’s finances. We need only look that at least three types of costs must be identified with each property to be acquired to the public patrimony:

- the cost of ownership acquiring the of the property. Traditionally, the used tool is the expropriation;
- the transformation cost of the area, necessary to make it usable;
- the management costs, necessary to maintain the efficiency levels, to comply with the safety laws and to improve the conditions of use in relation to the evolution of the laws and of maintenance techniques.

These three categories of costs, connected with particular steps of their life, can be associated to any public good that is labelled as “standard” or, more generally, as public equipment.

In practice, however, it happens that many of these goods lack one or more phases of the process, to mean that they have never been acquired to public assets (therefore never expropriated), or have been acquired but not transformed, or have been transformed but not maintained. This state of beings creates a lot of problems to the cities because the extension of these unprocessed or abandoned areas causes degradation and loss of quality in urban areas, as well as a significant waste of land and an economic damage because they are unavailable for other purposes (Fabbri & Mascher, 2009).

Closely linked to the resources is the issue of usability. If, in a first phase, the costs of expropriation and transformation were fully borne by the public administrations, it was immediately realized that this mechanism would have been unsustainable in the long term.

To solve this important issue, some solutions were proposed at different times.

The first solution was the involvement of citizens or other stakeholders in the construction of the public city, through the payment of charges to build (Law 10/1977, then repealed and merged in Presidential Decree 380/2001) when they require permits for the construction of new buildings or for radical transformation of existing ones.

The need derives from the link existing among increasing of soil value, urban transformation actions and increase in urban load, in terms of demand, that goes to weight on equipment and network infrastructures. As a result, it was established that the possession of this advantage would have as counterpart the fee of a share of the costs to equip these areas with infrastructures. In this way the community re-appropriates part of the increases in value, allocating them to the realization of public works.

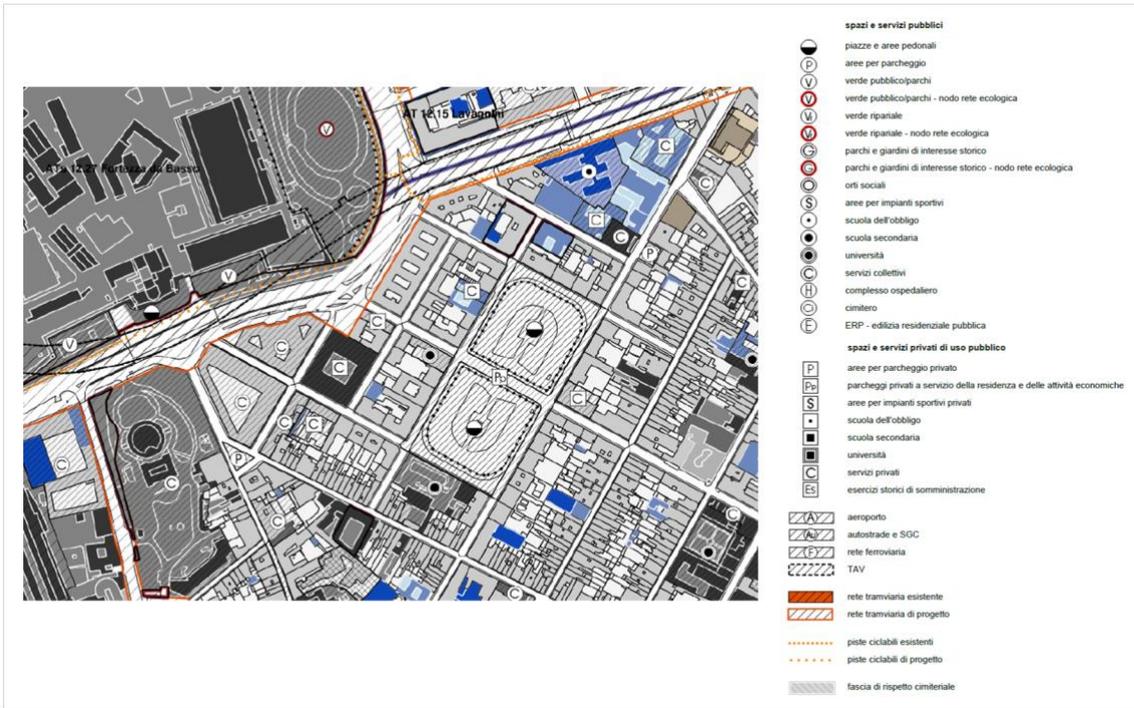


Fig. 1 Florence, Structural Plan. Equipment in the urban rule and discipline of soil and settlements. <http://pianostrutturale.comune.fi.it/mappe/>.

The scheme assumed that this fee was sufficient to cover the costs of urbanization. Often, this did not occur especially for the setting up of secondary urbanizations, the most significant ones (Fabbri & Mascher, 2009). We found the reason in the fact that, moreover, the funds reserved to this chapter of the local authorities' budget were often used for other purposes than the implementation of standards and urbanization. In any case, the amount of sums available did not guarantee the coverage of the above mentioned costs.

About this, Italian 2017 Budget Law (Law 232/2016) confirmed that the incomes deriving from the urbanization costs must be tied to specific destinations, that are:

- construction and maintenance of ordinary and secondary urbanization equipment;
- rehabilitation of buildings located in historic centres and degraded suburbs;
- reuse and regeneration interventions;
- demolition of illegal buildings;
- purchase and construction of green areas for public use;
- protection and rehabilitation of the environment and landscape, also for purposes of prevention and mitigation of the hydrogeological and seismic risk and of the protection and requalification of the rural heritage;
- interventions to encourage the establishment of agricultural activities in urban areas.

Second solution is the identification of public-private exchange mechanisms that would guarantee the public the cost-free property of the areas required for the implementing of standards and other equipment, in the face of the possibility for the private subjects to concentrate volumes and functions on the remaining surface area (Urbani, 2002; Micelli, 2004). These equalization mechanisms have the advantage of eliminating the costs

necessary for the first phase of acquisition but do not fully guarantee coverage of the second and, above all, of the third phase.

The third solution is to consider as standard private areas and equipment after the signing of specific conventions for public use.

In this case, the private sector, in the face of advantages identified from time to time, provides the community with a service of public use otherwise not feasible or feasible with high costs for the public administration. In this case, the public eliminates at least the first two types of direct costs. The advantage is obvious, even if to be verified case-by case basis and the costs are focuses on the third component. It may be a direct payment in the case of rents or other charges, or an indirect disbursement in the case of tax benefits.

The aspect related to the outcomes is not limited only to the financial issue, but it should be extended to the quality of the public works.



Fig. 2 Naples, Via Argine. Areas for urban standard and for public equipment. A, Green. B, Equipped green. C, General interest equipment, ABC headquarter. D, General interest equipment, sports hall Palaponticelli.

The application of the standards regulation has had a relevant quantitative feedback but a much more limited response in terms of quality. Generally, equipment falling into this category has not been able to raise the quality of cities, especially in areas where they should have acted more effectively.

In the urban expansions of the first crown and suburbs, for example, where the main poles of residential expansion formed after the Second World War have been concentrated, as in the case of Naples shown in Fig. 2. These areas require a greater attention, because their social and economic weakness caused by their recent formation.

It is also clear that this reasoning must be contextualised geographically and in relation with the urban dimension, and that there are cases marked by a great intrinsic quality. But, overall, it is not possible to dispute the fact that the design was "basic", using a magnanimous expression, with spaces and volumes often further degraded from a poor ordinary management.

Lastly, specific considerations must be made for the general interest equipment, which, according to DM 1444, should have been identified by the urban plans within specific areas designated for them (F zones).

Such equipment are necessary when there is the need to cover a demand for services whose catchment area is considerably higher than those of a neighbourhood are. These equipment may be existing or may be newly

established. In both cases it is necessary a constant checking of current and potential basins and of their extension. However, it is clear that they, unlike the DM 1444, derive from a forecast associated more to a territorial level than to a municipal one. It follows, therefore, that the programming of these allocations must be made at a supra-local level and that the urban plan should be up only the task of identifying the settlement area.

3. UPDATING

We comprise from the above the purely operational character of DM 1444. This character is a starting point for the building of a hypothesis of updating and adaptation under strongly changed conditions.

Standards are formulated as numerical limit values (measured in square meters for inhabitants) down below an urban plan cannot come down. They, in turn, are structured as an overall value divided, in turn, into four functional categories that are portions of the total.

Imposed fifty years ago, these threshold values are now outdated by the state of a greatly changed territory also for the results of years of urban planning. If we only think in quantitative terms, in fact, while fifty years ago in the overwhelming majority of municipalities the standard equipment for inhabitants was lower than the limits of the decree, today the situation is as overturned.

In other words, the issue of updating is not numerical, because in this case there would be no need to change the DM 1444. What we must to deepen is the connection between new needs, new necessities, new risks for the city and adequate and updated answers in terms of quantitative and qualitative characteristics of the equipment.

The change in the overall situation of cities can be the basis for building a new system of public equipment. This change can be exemplify using three different reading levels.

3.1 CHANGE OF PRIMARY PLANNING TASKS

The first reading level is connected with the change of primary planning tasks. Planning is born as an organized design of the urban expansions and it has gradually transformed, especially in nations with an advanced economic development: from an expansive process, it has become more and more transformative and connected with the built city. The latter becomes the place devoted to the construction of the city's innovation processes and the transformations of the built spaces are the actions that shall ensure to maintain and evolve the functional characteristics and the attractiveness of the city.

Obviously this reasoning become meaningless when we consider some areas of the planet where urban growth still takes place at a sustained pace.

Urban transformation processes are an effective way to preserve the territory because reduce or reset the land consumption modulating it in very diversified way through reuse operations of already urbanized spaces that may take the form of densification, of de-sealing (Artmann, 2014), or of re-naturalization (Mazzeo, 2012). The planning tasks must be updated also considering the processes of climate change and the circumstance that cities are among the main causes of the changes underway. At the planning level, it is possible to borrow a series of practices that can reduce the weight of the city. This must be done at all levels, from the strategic to operational planning.

From a quantitative point of view, the cited processes modify the influence of the city's public facilities in the sense that the existing or forecasting ones have to cope with loads that can vary positively or negatively compared to a previous state.

From a qualitative point of view, these changes can have an even greater impact because they can become a place of experimentation and application of new ways of managing the equipment according to social changes and to the processes of urban evolution.

The public city, in this kind of operations, becomes strategic within urban policies and, therefore, it acquires a centrality overdoing the simple numerical enumeration of the urban standards.

This change of paradigm requires a greater attention to the urbanized portion of the city, in order to guarantee the pursuit of the objectives of urban sustainability.

Excluding the expansion, in fact, every action of transformation must take place within the urbanized boundary, with the aim to bring the city a step closer to the finish line of the environmental neutrality.

In this respect, also the innovation of equipment and standard, meanwhile modifies the classical meaning of these elements, it contributes to the achievement of this goal and it becomes, in themselves, factor of public interest.

3.2 PERFORMANCES

Public equipment are useless if they are not efficient and if they do not have quality. The question concern the existing standards and those that will be implemented.

Therefore, the second reading level is the evaluation of the standards in terms of performances. Performance, in this case, indicates the operation level and the ability to perform with satisfaction the task for which the standard has been designed. Functioning has to do with both management and maintenance, in the sense that their correct execution maintains the standard. If the standard is based on a performance, it means that can be evaluated by way of thresholds. On the one hand, it can be fully efficient (threshold 100, for example), on the other hand, non-existent or out of order (threshold 0), with all the possible in-between gradations that the functioning can assume.

The performance level can be determined according to status and utilization indicators. It implies the need for a continuous control on the efficiency and on the degree of satisfaction of the demand. It presumes also a radical change in the methods of construction and management of the equipment, as it must be considered a good that is really available to citizens. A further element to put in place is the possibility that the performance efficiency of existing standards becomes a reward for the municipal administration.

The reasoning starts with the observation that if the standard is an obligation it must exist and work for the citizens-users. If we associate the "performance" qualification to an equipment, we assume the existence of different levels of efficiency.

It follows that the administrations that maintain their public equipment at an optimal functioning level can get some kind of advantage, for example, when they make plans or when the upper levels of administrations distributes public funds.

3.3 CHANGE OF THE STANDARDS WEIGHTS

A third reading level still hypothesizes a change, but this time it is measured in terms of variation of the standard importance, based on the consideration that the current social, demographic and economic reality of Italy has profoundly changed to that of 50 years ago.

The new urban conditions are characterized for a population in a general situation of quantitative stasis, if not often of regression; for strong changes in the absolute composition and percentage of different age groups; for a mutation of needs in terms of specific demands; for the need to respond to the challenge of climate change. These and other factors make it necessary to rethink the relevance associated with each category of public equipment. We can give some examples:

- in a town centre that is in a phase of population reduction the amount of equipment per inhabitant tends to grow even without any increase in total surfaces. In such a case, the numerator (equipment) is steady, but the denominator (population) decreases. Such a condition could be considered objectively positive. The downside consists in the fact that if the provision for inhabitant increases in the face of a decrease

in the population, it also increases the cost that each citizen has to bear in order to keep in efficiency these facilities;

- the distribution of the population in the age groups has changed to the point that the age pyramid has been transformed into another form with the basis that has become increasingly narrow. Consequently, the amount of specific demand linked to age changes. In particular, the demand for compulsory education tends to have an ever-smaller dimension, while the demand for services for the older age groups tends to increase (Pinto & Sufineyestani, 2018). This translates into a changing of the types of standards, with the shift of physical and monetary resources from one age group to the other. Specifically, from the youngest to the oldest;
- the reasoning referred to the previous point could be reversed if we decide that devoting more resources to lower age groups is strategically more important than dedicating them to the older ones, also with the aim to recover positions on the birth front. This would mean reducing the attention to the higher age groups but it changes the reasoning on the standards by technical to political. The same reasoning applies to the weight that the lower income social groups assume. It is a way to pay attention to marginal social realities, since the wrong distribution of resources is not only a function of age groups but also of the level of marginality within society;



Fig. 3 Hellerup, Danimarca. Gammel Hellerup Gymnasium, 2013. Architect: BIG. Photo: Iwan Baan²

- efficiency of buildings, production of energy from renewable sources and reduction of water consumption are three sustainability parameters to be applied to every standard, both in presence and in the absence of volumes. The public city, as also foreseen by European regulations, becomes the means to insert and disseminate good practices in the city related to the principles of renewability and sustainability;
- a possible strategic answer is the realization of flexible or mixed-use standards. These standards can give the answer to multiple needs in the same place or in the same volume, on the basis of a diversified use of spaces and equipment (Fig. 3).

² The equipment is a large multifunctional space that could be used for sports, graduation ceremonies and social events. <https://www.archdaily.com/412908/gammel-hellerup-gymnasium-big>.

These examples make it necessary to continuously check the characteristics and weights of the single standards so that they can respond to as well to the changes taking place.

This is a topic connected with equity between the different components of society and with a more correct “allocation of resources”, like economists say.

4. NEW STANDARD

4.1 METHODOLOGICAL ELEMENTS

The three reading levels above discussed represent the starting point for the development of a methodological path that, through the definition of a set of functional requirements parallel to the dimensional requirements that currently distinguish the standards, reaches the identify of new standard categories.

While new standards update the urban equipment systems to meet the new needs that the city has to face, the requirements are linked to a new way of thinking about urban equipment in terms of performance in addition to quantity, by reference to the characteristics of use and functionality that are required of them.

In this perspective, in fact, the requirements are used to ensure that the urban facilities are able to ensure the response of urban systems to a given necessity in terms of usability, simplicity, low cost of management, technological adequacy, and sustainability. Practically, they are aimed at ensuring the efficiency and the functioning of the standards.

Borrowing typical expressions of marketing, the requirements want to increase the degree of satisfaction of the users (the citizens) with levels of supply that can exceed the basic level (the quantity). They want to give them higher performance or, even, to assume attractive qualities encouraging the user to identify himself with the service and to feel it as part of their experience of urban life (Hinterhuber et al., 1997).

Among the potential functional requirements, some of them are highlighted below, with the warnings that the list is open to further extensions and that there are close interrelations between the different requirements:

- quality of the materials to be used for their realization, in order to guarantee the durability of the equipment and, at the same time, the sustainability and environmental compatibility for the entire life cycle. For example, the use of materials that can help to decrease the demand for air conditioning, or local materials to decrease transport emissions;
- consumption limits. This requirement is linked above all with the installed facilities and with the amount of energy necessary for their functioning. The requirement is also linked with the origin of the used materials and with the respect for the renewal requirements of the ecological stock. For example, use of recycled materials in place of first-use materials, or use of materials from controlled sources;
- emission limits of materials. The requirement, concerning the construction and use of materials, is related to the low amount of energy necessary for its production and to the low emissive capacity during use;
- usability limits. Requirement relating to the ability of the equipment to entirely perform its service. The limit must be intended as the identification of thresholds below which the equipment must be subject to requalification;
- time flexibility. Requirement to be understood as the possibility that the equipment can be adaptively used within 24 hours. For example, a soft mobility infrastructure that can be used for exhibitions or social gatherings;
- use flexibility. The requirement must be understood as the possibility of different uses. For example, a space / building that can host different activities in the same space and in different time slots. This requirement also presupposes the possibility that space can be easily reshaped according to needs;
- public and / or private handling. This requirement is necessary to compensate for the lack of economic and financial resources, thus ensuring a continuous use of the urban infrastructure. It also aims to enhance private initiatives worthy of some recognition depending on the activities they perform.

Tab. 2 shows the relationships between the seven requirements and the three reading levels, thus highlighting the relationship existing between them and the innovation processes underway. In doing so, it is possible to move on to the next phase, the identifying the new standard categories.

Functional requirements	Reading level a – New planning tasks	Reading level b - Performance	Reading level c – New standards weights
FR1. Quality of the materials		XXX	
FR2. Consumption limits	XXX		
FR3. Emission limits		XXX	
FR4. Use limits			XXX
FR5. Time flexibility	XXX	XXX	
FR6. Use flexibility			XXX
FR7. Public/private handling	XXX	XXX	

Tab 2 Functional requirements of the new standard in relation with the three reading levels.

4.2 NEW STANDARDS

In line with what we described up to now, the evolution of the needs and demands of today's cities, and the urge to direct urban policies towards increasingly compelling conditions of environmental sustainability need the adoption of an integrated and multi-functional approach to the standards. This approach can provide answers to new demand such as the protection from the hydraulic risk, the reduction of polluting emission, the loss of biodiversity. Moreover, one factor that is increasingly important in the functioning of the cities is related to the efficiency of mobility systems and, therefore, the accessibility to the different parts of an urban area. The setting up of the proposal of standard reshaping put together two complementary concepts, that of urban standards and that of design standards for buildings. At first sight, they do not seem to be embeddable among them, but the need for a deep update of the regulation on standards also brings with it also an update of the concept of standards, as above highlighted. This deepening in itself extends the meaning of standards and involves aspects that the 1968 legislation didn't take into account.

It is worth emphasising that if on one side the construction of the standard as a characterizing element of the public city should not be abandoned because it is a reference point of the actions implementing the planning on the urban territory, on the other it is useful to consider also provisions introducing quality standards for buildings. This double value of the standard can be interesting for two fundamental reasons:

1. Public buildings can be considered as second level standards (first level are surface standards) for which to provide quantitative and qualitative norms. Because public these buildings should be a flagship of the methods of construction of the city of tomorrow, in which the standard can be not only the surface but also the quality in the use of it, the healthiness of the products used, the reduction of overall impact of buildings.
2. The good practices of the public city, deriving from the implementation of the new standards, become quality elements applicable also to the whole city, even if with different modalities and obligations. In this way, the private construction and redevelopment activities can be channelled on the same tracks as those of the public city.

The potentiality of this process lies in the circumstance that transforming the way of building and regenerating translates into a net gain for the community into the medium and long term.

In this perspective, and with reference to Table 2, which relates the reading levels with the functional requirements, we identified some new categories of potential standards.

- Energetic standard. The equipment, both two-dimensional and three-dimensional, must consume always less and produce ever-higher percentages of energy using the available renewable sources (Papa et al., 2016). The same reasoning applies to dispersions in the atmosphere, on the ground and in water.

- Emissive standard for building and areas. The choice of materials and their correct use makes it possible to reduce the emissions of heat and harmful gas from urban surfaces. To favour this aspect it is necessary, above all, the use of qualitatively superior products whose effects will be perceived in the long term.
- Advanced design of public spaces. This category of standard is one of the least classifiable within this process of updating, but it may be interesting to push towards a design that refers to the best practices. In this way, it is possible to positively influence on some territorial phenomena such as the urban heat islands, result of the impermeable waterproofing of the territory (Zanchini, 2011).

We emphasize that the issue of the quality of the design is a pre-condition in many projects at international level. It must also be extended to current design, much less attentive to these aspects.

- Ecosystem urban green. Ecosystem services (for a classification, La Notte et al., 2017) merge new meanings linked to the environmental criticalities (Giaino, 2018a). The urban green, one of the classical rates of the standard, represents a mono-functional space, generally underutilized, which instead can take on new meanings (Pelorosso et al., 2013).

We need only consider the possibility of modelling it in such a way as to become an active component in the local response to climate change and in the management of meteorological crisis conditions (storm water management) (Mazzeo & Zucaro, 2017). Water plazas, different types of essences, subsoil conformation, rainwater collection, physical connections between currently separate green areas, green corridors and bypass, are some of the working tools that can be associated with these services (Fig. 4). The expansion of new green infrastructure networks can take place with the removal of hard surfaces, with the aim to protect public and private goods and to store storm water for derivative uses. They can also help to better absorb flood events, just like they can help to rethink the importance of the infrastructure, and to modify our relation with the nature in the city.



Fig. 4 New York, Gowanus Canal, Sponge Park™ Project. Dianstudio. <https://dlandstudio.com/Gowanus-Canal-Sponge-Park-Pilot3>.

³ Sponge Park™ re-directs, holds, and treats storm water runoff to minimize the volume of overflows that occur within the canal, reducing raw sewage contamination and thus helping to clean the watershed.

The ecosystemic urban green is both a local and urban level provision. In this perspective, thus, it falls within the category of the traditional standard as well as that of equipment of general interest, as defined in the DM 1444. The intent of its inclusion among the new standards lies in the fact that it can be formed to face requirements that are not just those of the use as green areas. As an ecosystem standard it can be built in order to function as a thermal regulator (arboreal essences, tree density, ponds, and so on), as a regulator of the water flow rate in case of heavy rains (water squares, underground tanks, and so on), as part of a network of territorial green corridors fitting within the city.

- Urban farming standard. An essential type of ecosystem services is related to the maintenance of agricultural production in suburban areas, critical areas for the proximity with the city, and its systematic introduction into urban centres. In this case the new standard assumes a double value: it preserves natural ecosystems (also using biological production techniques, with the abatement of the use of chemical products), and it produces value in terms of exchange goods and income (Collarini, 2018). Urban green and urban farming can structure a system of active areas that we can define green and blue infrastructures, forming continuity channels within the urban array (Cannas & Zoppi, 2017).
- Standard connected with mobility and accessibility function. The accessibility of urban areas qualifies in terms of possibility of using vehicles other than the car. Key elements of this potential standard are the frequency of public transport, the percentage of users of public transport, the density of pedestrian and cycle axes, the quality of the connection spaces (Fig. 5), and the existence of equipment that facilitates the move of lower mobility groups (slow mobility) (Papa et al., 2017). It also includes equipment that facilitate the use of individual non-polluting means (electric, natural gas, and so on), as well as those related to the accessibility of internet and IT services.
- Standards related to social housing, collective residence and spaces for carrying out specific working and service activities with strong innovation matrixes. This standard deepens the possibility of building flexible relationships that allow the socialization and implementation of specific projects related to periods of study and training, to non-continuous work activities, to temporary residency.



Fig. 5 Prato, Piano Operativo. Green reconnection in San Paolo neighbourhood. Source: Urbanpromo/2018.

The listed categories can be considered in a double role: as an evolution of current standards or as the insertion of new categories within planning's procedures. In both cases, the new standards must be associated with the same obligations currently in force as those contained in DM 1444/1968 (Fig. 6).

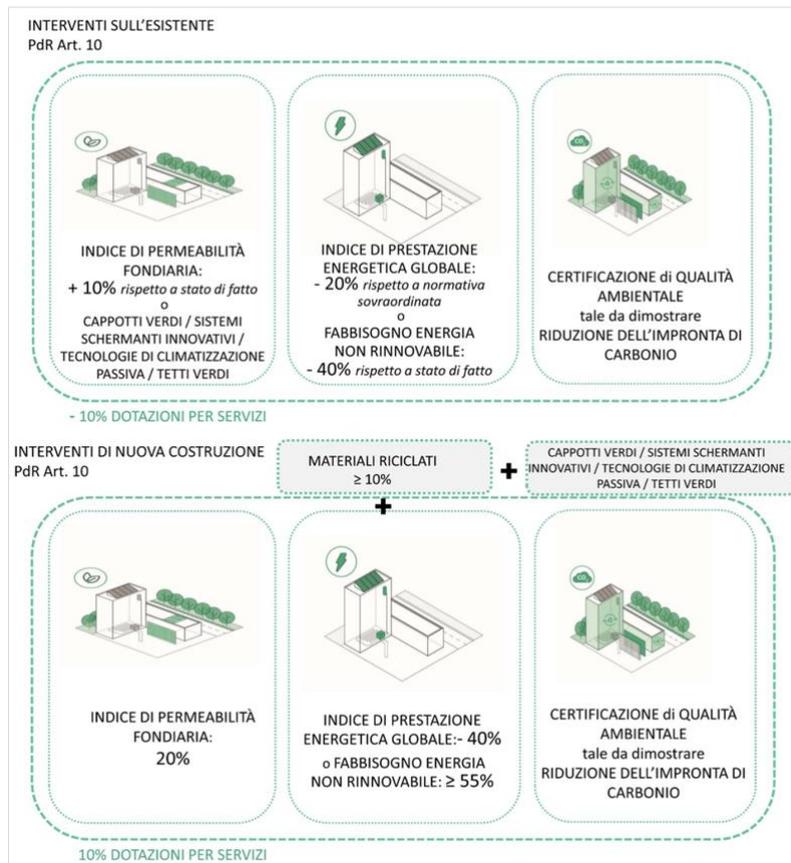


Fig.6 Milan, “Milano 2030”, Revision of the Piano di Governo del Territorio (PGT), Piano delle Regole, Norme di Attuazione, art. 10. New standard for existing and new buildings. Collarini, 2018 http://allegati.comune.milano.it/territorio/20181029_PGT_Giunta_Def/03_Piano_Regole/01PR_Norme_Attuazione.pdf

Figure 7 highlights the relation among new categories of standard and functional requirements, showing the intersections with conditions to deepen in a next step are present. These conditions do not replace the existing quantitative limits but integrate them with new properties that can be defined either through further numerical limits or through quality assessments namely, the identify of specified characters for each of them, the dimensions, and the levels of effectiveness within urban structures. Fundamental will be the preparation of a computerized catalogue of best practices, where technologies and solutions are compared and updated.

Main standard category	Secondary elements	Existing standards (DM 1444/1968)	Requirements for checking the functionality of the standard						
			Quality of the materials	Consumption limits	Emission limits	Use limits	Time flexibility	Use flexibility	Public/Private handling
Energy Control				Y	Y				
Buildings	Schools	YES	Y	Y	Y	Y		Y	Y
	Public Equipment	YES	Y	Y	Y	Y		Y	Y
	Other	YES	Y	Y	Y	Y			
Areas			Y			Y	Y	Y	
Green Spaces			YES			Y	Y	Y	Y
Urban Water						Y	Y	Y	
Urban Farm				Y			Y	Y	Y
Mobility	Pedestrian Paths		Y			Y	Y	Y	
	Cycle Paths		Y			Y	Y	Y	
	Public Transport Hub		Y	Y	Y	Y			Y
	Roads		Y			Y			
	Parking	YES	Y			Y	Y	Y	Y
Housing	Social Housing		Y	Y	Y	Y	Y	Y	Y
	Collective Housing		Y	Y	Y	Y	Y	Y	Y
	Incubators - production		Y	Y	Y	Y	Y	Y	Y

Fig. 7 New standard categories and properties for checking their functionality

5. CONCLUSIONS

The insights made on the subject of public equipment have outlined the existence of lights and shadows and the clear need to get a grip to a profound conceptual and operational renewal.

The research of new categories of standard is not sufficient to understand the extent of the evolutionary process that urban planning practice must achieve. It is necessary, in fact, a parallel reasoning on the requirements they must possess in order to respond effectively to new questions arising from the city.

Standards in their original formulation (DM 1444/1968) had to respond to a single dimensional condition that is to respect minimum thresholds of quantity. This condition was sufficient to proceed with the approval of urban plans and left any other implementation or use specification to the build phase.

The necessary progress must be to enrich the contents of the standards requirements already in the planning stage, in order to highlight the potential benefits of their implementation adapting this aspect of the plan to the complexity situation reached by the cities.

The Italian urban planning literature has underlined the problems that the legislation on standards has generated (inter alia, Falco, 1987; Treu, 1998; Zoppi, 2003; Giaimo, 2018b). Plans characterized by highly mechanistic and deterministic arrangements, an interest based only on the quantitative aspects of the equipment, without any attention to the qualitative aspects, the poor attention to services not foreseen by the law's categories, the indifference to the territorial specificities.

The resulting application has certainly improved the life conditions in the city as it operated in a situation of serious emergency and it has introduced into the planning the principle that every citizen has the right to a share of public services. As Campos Venuti writes (2001, 43): «The *Legge ponte* and the decree on standards recommended social and environmental quality objectives for the plan».

This should not make us forget that for a long time the evolution of the concept of public services has undergone clear delays because the potential testing got bogged down on the obstacle of legislative constraints. In other words, the urban planning standards have allowed to equip the cities with new and numerous public facilities, but these, very often, have not been able to express urban quality and to become a recognized aggregation factor.

Next to the question of quality, there is the question of the adaptation of equipment to a changed urban reality, thanks to demographic, social, economic, and environmental changes.

The issue of the reuse of underused or abandoned equipment due to causes such as demographic decline, or the social changes shifting the needs within the city, is cited as one of the factors affecting the maintenance of the stock of equipment built by the institutions over the years. It is a topic of great interest with at least three critical aspects. The first is the opportunity to erode the stock of public goods, in some cases now oversized. The second has to do with the costs of maintenance and management of public goods, a cost that goes up with the decrease of inhabitants (but also with the increase in the mean age of the population), but that must be taken into account also in case of functional change. The third aspect is related to the ability of the city to adapt its equipment offer to changing needs, realizing equipment fitted with high use flexibility.

All together, these changes require a deep rethinking of the public city within an urban structure that today is radically different from that of fifty years ago.

The need to deep the reasoning on the public city results by an unprecedented combination of deeply troubling environmental problems, political changes, and innovation in technology and design. To deal with this state it is necessary an interdisciplinary work creating new urban model as result of the knowledge of planners, hydraulic engineers, transporters, ecologists, economists, and exponents of culture, with the aim to shape better-performing and more compelling cities to work, live, and raise families. It is necessary, for example, to «understanding how physical geography, ecology, and climate function is critical to the development of new types of infrastructure that are more responsive to the forces of nature» (Drake, 2016).

It is also evident that local administrations cannot implement this program if they are alone. They must have the support of upper government levels within a national program for the adaptation of cities to ongoing changes.

Based on the considerations carried out, the paper has proposed a qualitative methodological scheme. First step was the analysis of some reading levels requiring a process of adaptation of the planning techniques and contents, in general, and of public equipment, in particular. In order to get to the proposal of new categories of standards, an intermediate step was the identification of a set of general functional criteria of the equipment. The intersection between functional criteria and new categories of equipment generates a field of study to deepen by means of specific quantitative and qualitative functional criteria.

This methodological structure necessitates because DM 1444 adopted a quantitative approach, who looked at infrastructures as a machine functioning thanks to simple numerical combinations. Today the situation has changed and it became clear that qualitative processes, with greater flexibility, must support the numerical systems. In this way, they can increase the answer of urban systems to complex social and environmental events.

AUTHOR CONTRIBUTIONS

Although this paper should be considered a result of the common work of the authors, G. Mazzeo took primary responsibility for the sections 2.2, 3.1, 4.1 (with F. Zucaro), 4.2, R. Morosini for the sections 2.1, 3, and F. Zucaro for the sections 3.2, 3.3, 4.1 (with G. Mazzeo), meanwhile the part 1 (Introduction) and 5 (Conclusions) are a product of the shared reflections between the three authors.

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SUCCESS FACTORS OF SMART CITIES

A SYSTEMATIC REVIEW OF LITERATURE FROM 2000-2018

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ABSTRACT

The aim of this paper is to review smart city literature to achieve these goals. More than 150 sources of literature were approached and analyzed with a view of finding out drivers and success indicators of smart cities on which future research policies are depend. The results pointed out several drivers that stimulate cities to be smart. These drivers are related to economy, environment, governance, safety, energy, living, technology, buildings, education and people. Interestingly, a smart city should be distinguished by smartness extent achieved to meet the requirements of these drivers. That is, a smart city is the one that marked by its own smart economy, smart environment, smart governance, smart safety, smart energy, smart living, smart technology, smart buildings, smart education and smart people. This paper contributes to smart city literature by showing drivers and indicators related to smart cities success.

KEYWORDS:

Smart City; Drivers of Smart City, Indicators

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智慧城市的成功因素：系统性文献综述（2000-2018）

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摘要

本文旨在通过梳理智慧城市文献资料，实现所述目标。通过对150多篇文献资料进行查阅和分析，发现智慧城市各大驱动因素和成功指标，供未来研究政策所参考。研究结果指出了促使智慧城市形成的几大因素。这些驱动因素涉及经济、环境、治理、安全、能源、生活、科技、建筑、教育和人员。有趣的是，一座智慧城市的划分，应取决于该城市达到的智慧程度是否满足这些驱动力的要求。也就是说，智慧城市是以自身的智慧经济、智慧环境、智慧治理、智慧安全、智慧能源、智慧生活、智慧科技、智慧建筑、智慧教育、智慧人员为特征的城市。本文通过阐述与成功的智慧城市相关的各大驱动因素和指标，为智慧城市的研究文献做出了贡献。

关键词:

智慧城市; 智慧城市的驱动因素; 智慧城市的; 成功指标

1 INTRODUCTION

In recent years the smart city concept becomes a general term used to refer to a positive process of urban areas (economic, environmental, transport, social, etc.) (Papa et al., 2015). Smart city concept has gained great attention in the literature since the concept was deemed as a crucial aspect of future urban planning (Albino et al., 2015). Babar (2016) estimated that 80 percent of citizens all over the world by 2020 will live in cities. Monteiro et al. (2018) pointed out that the real reason behind the emergence of this term was to find appropriate solutions in response to population growth in the cities. Numerous terms related to the smart city concept were found in the literature. Examples of these terms include: intelligent city, innovative city, flexible city, attractive city, and resilient city, digital city, high-tech city, green city, and low carbon city (Albino et al., 2015; Caragliu et al., 2011; El-Messeidy, 2016; Makhoul, 2015; Tahir and Malek, 2016).

The concept of the future city at the urban scale, focuses on the improvement the relationship between technological advancement and sustainability challenges (Moraci & Fazia, 2013). In general, definitions of smart city concept followed two major lines; a narrow line and a wider line. The narrow line in defining smart city describes this concept in terms of information and communication technology used in cities in order to manage activities, events, resources and to cope with city development consequences.

In this line information and communication technology was used to provide solutions to problems facing cities (De Oliveira et al., 2018). The widest line of the concept encompasses several aspects that go beyond information and communication technology such as social, economic and environmental aspects (Lacinák & Ristvej, 2017; Makhoul, 2015; Tahir & Malek, 2016). In a study by Albino et al. (2015), more than twenty-five definitions of smart city were cited. These definitions can be categorized into two groups related to information and communication technology and a mix of technology and investment in physical, human and social capital using governance and economic development framework. Beretta (2018) conceptualized smart city as an integration of information and communication technology with human and social capital. In the same context, Caragliu et al. (2011) divided the concept of smart city on the basis of its infrastructure into two types which were physical infrastructure along with the human and social infrastructure. In this paper, the wider line of smart city definition was followed to gain more understanding of this concept and factors that play critical roles in its achievement as an intended goal of many cities across many countries. Adopting the wider perspective of smart city, the term was defined as a system of inter-correlated subsystems, including energy, mobility, flows of materials and services, and people (El-Messeidy, 2016).

The introduction of the smart city concept was derived by numerous factors. Many countries are striving to have its own smart cities due to numerous challenges such as dealing with the increased growth of their population, increased pollution of air and contributing to the global to reduce the warming dilemma (El-Ghorab & Shalaby, 2016; Lacinák & Ristvej, 2017). In order to eliminate or at least reduce these problems, a deep review of smart city literature is required to determine aspects that should be kept in mind when smart city planning process starts. These aspects represent indicators of smart cities and can be considered as outcomes for smart cities development. These indicators enable cities to achieve criteria stipulated to describe a city as a smart city (Al Nuaimi et al., 2015). That is, indicators of smart city refer to success factors of developing smart cities. They highlighted some examples of these indicators such as intelligent management of city resources and facilities, mobility, environment, governance, and people. Meijer and Bolívar (2016) indicated that a smart city can be described in terms of three major components: smart technology, smart people, and smart governance. Tahir and Malek (2016) studied the requirements of achieving smart city goals and concluded that smart environment and smart mobility were the most important indicators of the successful development of smart city, followed by other indicators such as smart living, smart economy, smart governance and smart citizen.

Tok et al. (2014) cited the following smart cities indicators: smart living, smart mobility, smart environment, smart economy, smart people, and smart governance. All in all, indicators of smart cities when achieved are

regarded as signs of successful construction of smart cities. Al Nuaimi et al. (2015) reported several definitions of smart city from which different aspects of smart city can be concluded.

Indicators of smart city extracted from these definitions include physical infrastructure, social factors, human factors, the Internet of things, monitoring of resources and life activities in a country such as roads, ports, communications, natural resources, transportation, socio-economic development, improved governance and innovative management of resources.

Joshi et al. (2018) identified six indicators of smart cities: smart living, smart governance, smart people, smart economy, smart mobility and smart environment. Numerous literatures carried out on smart city revealed the same indicators (Cocchia, 2014; Arroub et al., 2016).

Based on these studies, the main focus of this paper is on indicators that distinguish smart cities. In fact, these indicators can be used to guide the overall process of smart city adoption since it provides policy makers, urban planners and designers with criteria that should be noted in the construction of smart cities. On the other hand, this paper enriches the body of smart city literature by elaborating significant lessons learned from global experiences in the same domain.

In other words, indicators of smart cities can be analyzed to draw a conclusion about the success factors of smart cities. (Minimum length of your contribution is approximately 40.000 characters including spaces).

2. RESEARCH METHODOLOGY

2.1 RESEARCH STRATEGY

Khan et al. (2003) identified five steps of conducting systematic reviews; formulation of research questions, searching relevant sources of papers and identifying inclusion and exclusion criteria, assessment of study quality design, summarizing the evidence and interpreting the results. Uman (2011) reported the following phases of systematic review; formulation of research questions, definition of inclusion and exclusion criteria, developing research strategies and locating articles, a selection of articles, extraction of data from these articles, assessment of study quality, analysis of studies and interpretation of findings.

Cocchia (2014) conducted a systematic review of smart city literature from 1993-2002 by collecting, storing and organizing a set of papers on the smart city concept on the basis of time, terminology, definition, typology and geographic analysis. Research strategy used in this paper consisted of formulation of research questions, the criteria used for inclusion, selection of articles, analysis of articles, and interpretation of findings.

2.2 RESEARCH QUESTION

The challenges faced by the developing countries are still full of the many problems facing sustainable development, which need integrated solutions for these problems in different sectors, by a focus on communications and information sector that have become the characteristic of urbanization.

For most of the cities of the world, information technology has become an important factor in the change and development of cities. The global network (Internet) has changed the urban planning model by convincing traditional planners to look at the urban planning of the city.

The technology to make the economy, the environment, mobility and governance more efficient and efficient. The concept of "growing cities" on the implementation of the correct urban planning can transform the city into a Smart city. This paper seeks to answer the following question: what are indicators of a smart city? In fact, answering this question guided the research towards a new direction.

That is, the determination of smart city indicators helps to propose a theoretical model on which future studies can depend in order to evaluate the effectiveness of smart cities and to determine the outcomes of these cities.

2.3 CRITERIA OF ARTICLES INCLUSION

Relevance of articles in terms of content, publication date, and type of the journal. Content of selected articles should be related to the research question. Articles were included in the systematic review after reading. Publication date of articles should be from 2000 to 2018.

So, the article published before 2000 was excluded from the review. On the other hand, all articles used in this paper can be cited using journal name, volume or issue number. Some articles were selected from proceedings related to the same context.

2.4 STUDIES SELECTED

The initial round of articles collected through searching databases resulted in 171 articles. Numerous keywords were used when searching for articles such as smart city, urban sprawl, transportation, Urbanism, governance. Out of these articles, 74 articles were excluded on the basis of their contents.

Due to the type of the journal and publication date limitations, 13 articles were also excluded. Hence, the final number of articles included in this review were 84 articles.

3. FINDINGS

Tab. 1 shows smart city indicators found in the literature. Examples of these indicators can be categorized under 12 characteristics: smart living, smart economy, smart environment, smart education, smart governance, smart energy, smart safety, smart mobility, smart technology, and smart buildings. These pillars were designated as dimensions, components, indicators and factors of smart cities.

No.	Smart city success characteristics	Related features	Researchers
1	Smart living	Life recreations like stadiums, theaters, public libraries; Healthy housings; e-life styles; cultural facilities and diversity	Chorianopoulos et al. (2010); Giffinger & Gudrun (2010); Occelli & Sciallo, (2013);
2	Smart economy	ICT infrastructure; labor market flexibility; ICT-based production process; productivity; use of e-business applications; economic image; high tech industries	Angelidou (2017); Caragliu et al. (2011); Lombardi et al. (2011);
3	Smart environment	Low level of carbon dioxide emission; open green spaces; water efficient use and water quality; effective management of waste and recycling; pollution control; sustainable development of urban areas; recycling projects	Nam & Pardo (2011); Lombardi et al. (2012); Lazaroiu et al. (2012); Balakrishna (2012); Pan et al. (2013); Jayashree et al. (2014); Tok et al. (2014); Abdou (2014); Buckman et al. (2014);
4	Smart education	Education facilities, percent of funding research by private sector; remote access to education programs;	Albino et al. (2015); Li et al. (2015); Al Nuaimi et al. (2015); Amditis & Lytrivis (2015); Meijer
5	Smart governance	E-government services; research and development centers in the city; smart administration; participation in decision-making process; transparency.	

6	Smart energy	Renewable energy projects; efficiency of energy systems; percentage of electricity generation; total consumption of energy	and Bolivar (2016); Sharma & Gupta (2016); Tahir & Malek (2016);
7	Smart safety	Individual safety, city sensor tracking; alerting systems; emergency response systems.	Olaverri-Monreal (2016); El-Messeidy (2016);
8	Smart mobility	ICT-based transportation; ICT-driven logistics; advanced driver assistance systems; smart maintenance; safe transportation; sustainable transport system, e-monitoring of transportation system.	Lacinák & Ristvej (2017); Abo-elazm & Ali (2017); King & Perry (2017) ; De Oliveira et al. (2018); Venkatesan (2018);
9	Smart technology	Internet infrastructure; Intern accessibility at homes; high-tech training; and software engineering.	Beretta (2018); Kaur et al. (2018); Hargreaves et al. (2018); Klassen &
10	Smart buildings	Housing quality, using solid waste management, reduced cost of construction; smart heating, smart air conditioning, smart monitoring; smart lighting; smart plug load; and smart window shading.	Buske (2018); Wu et al. (2018); Adapa (2018); Joshi et al. (2018), Thaduri et al. (2018); Al- Alwani (2018); Ibrahim et al. (2018).
11	Smart hospitals	Health conditions; health care services; e-monitoring of patients at home; connections between hospitals; biomedical sensors and hospital smart architecture.	
12	Smart people	Innovative solutions to city problems; participation in sustainable development; participation in public life; access to e-training and e-learning courses; skilled workforce; employment rate in knowledge sectors.	

Tab. 1 Success indicators of smart city found in the literature

4. DISCUSSION AND CONCLUSION

The main idea behind the construction of smart cities is to make cities more adaptable to challenges in different contexts. According to Abo-elazm and Ali (2017), evaluating the development of smart cities can be achieved in terms of the assessment of benefits such as functional, structural, formational, technological, economic, social and environmental benefits. Guiding smart city construction using the idea that built on the integration of numerous smart aspects to be effectively employed by technology solutions was in agreement with many conceptualizations of this term as provided by many authors (Abo-elazm & Ali, 2017; Albino et al., 2015; Al Nuaimi et al., 2015; El-Messeidy, 2016; Lacinák & Ristvej, 2017; Lombardi et al., 2011; Sharma & Gupta, 2016; Tahir & Malek, 2016; Wu et al., 2018). The results of the literature conducted in this paper pointed out that smart cities are built on several pillars: smart living, smart economy, smart environment, smart education, smart governance, smart energy, smart safety, smart mobility, smart technology, smart hospitals, smart buildings, and smart people. The following sections provide a detailed explanation of each of these dimensions. Smart living refers to life recreations like stadiums, theaters, public libraries, and entertainment venues (Albino et al., 2015). Wu et al. (2018) defined smart city as a city digitally designed using advanced applications of information and communication technology like Big Data, the Internet of Things (IoT) and cloud computing. For the National development and Reform Commission of China, the concept of smart city was described as a

new model or idea adopted to plan, construct, and manage service based on cloud computing, Big Data, and IoT (Li et al., 2015). Simply defining the concept, Tok et al. (2014) and Ibrahim et al. (2018) described smart city in terms of quality of life. Smart economy, according to Albino et al. (2015), represents a key theme of smart economy, which was the availability of information and communication technologies and the ability to use technologies in production.

For Ibrahim et al. (2018), smart economy represents the concept of competitiveness. Lombardi et al. (2011) specified five smart cities indicators: smart living, smart people, smart economy and smart environment. Concerning the smart environment, Lombardi et al. (2012) portrayed this dimension of smart city in terms of level of Carbon dioxide emission, green spaces, efficient water use, effective management of waste and recycling. Smart education, on the other hand, refers to using electronic learning applications that enhance the learning process, computerized schools and ensuring students access to educational resources (Sharma & Gupta, 2016). Al Nuaimi et al. (2015) indicated that smart education can be achieved through the use of information and communication technology that enhance citizen involvement in learning environment and knowledge management practices and building knowledge-based community. Moreover, Lombardi et al. (2012) represented smart governance in terms of the number of universities in the city and research centers, e-government services, Internet access by homes, and the number of e-government users.

In relation to smart energy, El Messeidy (2016) defined smart energy-oriented smart city as a city uses renewable and efficient energy and provide its occupants with access to energy. Therefore, the focus of smart energy is to reduce energy use and greenhouse gas as well as to encourage innovation in this context (Stoltz et al., 2015). Smart safety, according to Van Heek et al. (2016), exemplifies a critical component of smart cities due to its role in ensuring an effective participation of people in social as well as economic life. Examples of smart safety application include tracking misbehavior of people, monitoring social activities, and detecting specific people in case of disasters and criminals (Pan et al., 2013).

Albino et al. (2015) indicated that the aim of smart mobility is to enhance transportation the city through the employment of advanced technology in transportation process. For Pan et al. (2013), smart mobility or transportation is one of the most important applications of smart city by which cities can manage traffic conditions, supply and demand of transportation, route navigation and reporting traffic state. Examples of smart mobility can be found in Germany, USA, France and Singapore (Joshi et al., 2018). Smart technology in its general definition covers other factors of smart city such as smart living, smart energy, smart transportation (Meijer & Bolivar , 2016). For the current study, the concept was analyzed as a separated factor in order to describe the availability of the infrastructure of the Internet in the city in addition to Internet access as well as technology innovations. King and Perry (2017) identified several technologies that can be used to enhance operations of smart buildings.

These technologies are related to smart heating, smart air conditioning, smart monitoring, smart lighting, smart plug load, and smart window shading. Examples of smart hospital systems include electronic monitoring of patients that provide two major activities: continuous follow-up of patients and transfer of e-data (Jayashree et al., 2014). Finally, the concept of smart people describes citizens who have innovative solutions to city problems, participate in the sustainable development as well as the public life, skilled and have an access to e-training and e-learning programs (Giffinger & Gudrun, 2010, Hernández-Muñoz et al., 2011; Nam & Pardo, 2011).

A final note in this paper indicated that adopting the concept of smart city, planning to construct this city and putting it into practice considered a beneficial step in the right direction since these cities help countries to cope with different challenges either at global, regional or local levels. Successful indicators required to construct smart cities depend not only on smart technologies used in these cities, but also on another set of indicators comprise smart economy, smart governance, smart environment, smart mobility, smart living, smart safety systems and smart people.

The most critical point revealed in the literature is that all indicators of the successful development of smart cities should be integrated as a one system which utilize smart technologies to achieve this goal. The ultimate end of these integrated indicators is a smart city characterized by advantageous services provided to occupants.

5. PLANNING IMPLICATIONS AND FUTURE RESEARCH AGENDA

The results pointed out, based the review of the literature conducted in this paper help policy makers, urban planners and designers by underling benefits and success factors that should consider in order to translate theoretical concepts of smart city into real projects. Lacinák and Ristvej (2017) indicated that smart cities enable countries to solve numerous problems such as air pollution, population growth and ecosystem problems such as global warming. In an effort to cope with these challenges, smart city concept was introduced as an overall system link different aspects of city life, including environment, energy, people, transportation, governance and so on. In order to ensure an effective construction of smart city, the ultimate result of a smart city project should produce a city with distinguished indicators. Many drivers that lead countries to create their smart cities were found in the literature.

The main source of these drivers are challenges facing cities. El-Ghorab and Shalaby (2016) indicated that challenges and their related reasons are the main sources that results in countries adoption of smart city solutions. According to Klassen and Buske (2018), planning and designing smart cities requires an integration of three main aspects: needs of residents, quality of life standards and availability of services. However, readiness for change as stated by Ibrahim et al. (2018) should be considered in smart city planning. Lazaroiu and Roscia (2012) reported two main conditions for a city prior, to be smart city: it should be a medium city with a full coverage of accessible databases. Reed et al. (2018) highlighted the importance of relationships between natural and artificial environment. Reviewing conclusions of previous studies conducted on smart cities in different regions revealed many suggestions.

For instant, providing a broaden research to cover many smart cities (Beretta, 2018) in relation to many aspects such as sound analysis to detect noise pollution (Bello et al., 2018), smart water solutions (Dickey, 2018), using computational intelligence to enhance education (Gomede et al., 2018), smart streets (Ahmed & Rani, 2018), smart water grid (Kim, 2018), and smart parking (Tomar et al., 2018). Future research on smart cities construction could be conducted to investigate the impact of mart cities on functioning of cities in terms of benefits acquired as a result from the development of smart cities. Since buildings are the main aspect of cities, the overall concept of smart city should consider how these buildings could be transformed into smart ones. Therefore, case studies of smart buildings across the world should be reviewed in order to justify their constructions and adopt criteria that fit the local environment and resources well.

Finally, it was concluded that smart cities should meet several criteria to deserve this name, these criteria include basic consideration that these cities should show such as adaptability to environmental problems, ability to meet citizen's needs, construction on the basis of people skills, and utilization of innovative solutions with adopting new technologies. Additionally, further studies in the same context are required, such as factors that hinder the adoption of the smart city concept, Recent studies highlighted the importance of new trends in smart cities context like using cloud computing to provide and support new services (Hosseinian-Far et al., 2018).

This paper contributes to guide future study, especially in developing countries towards guiding sustainable development programs to build smart cities by focusing on smart cities pointers, mind full, highly tactile smart cities and the critical success factors that will enable developing countries to achieve progress and development in the future, and access to the quality of life.

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IMAGE SOURCE

Fig. Cover: Jul 24, 2017 by Gary Shapiro, Three Reasons Why You Should Invest In Smart Cities Now. Consumer Technology Association President and CEO.

Rest of table by the author.

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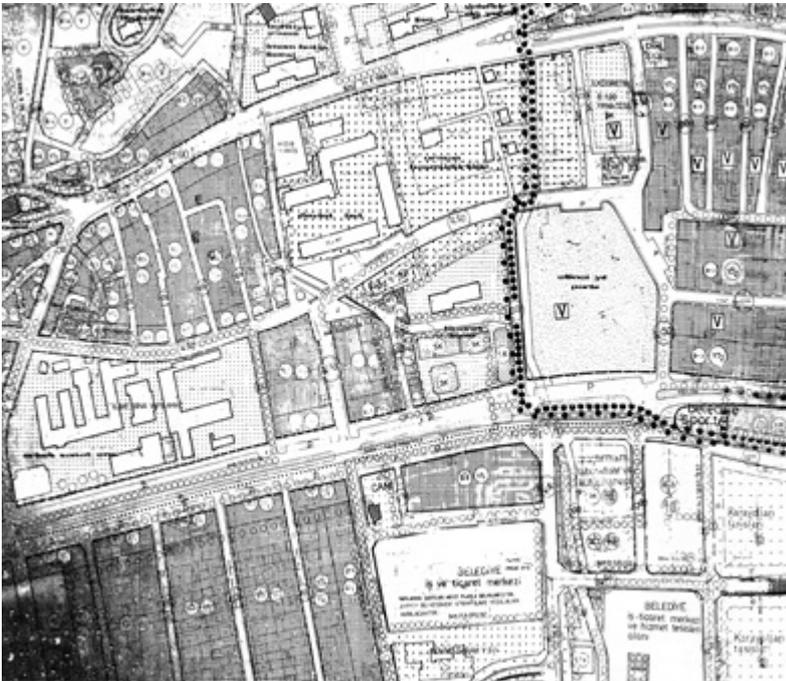
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ANALYSIS OF THE FIRST URBAN REGENERATION AREA IN KOCAELI AFTER GÖLCÜK EARTHQUAKE BY USING ZONING PLANS

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ABSTRACT

Rapidly growing cities following The Industrial Revolution remained insufficient to fulfill today's necessities. Also, natural disasters such as earthquakes, floods or unsound structures have affected the development of cities adversely. Although natural disasters can be unpredictable, the issue of preparing cities for natural disasters, planning cities and regulating laws accordingly are becoming increasingly crucial. Urban regeneration activities are one of these preventions taken in this purpose. It is observed that countries such as Turkey, faced with natural disasters intensively, suffer from serious physical, financial and moral losses. Therefore, urban renewal activities have gained importance in Turkey after The Gölçük Earthquake (7.4Mw) and The Düzce Earthquake (7.2Mw) in 1999. The first urban regeneration project in Kocaeli where was one of the cities experiencing hard collapses of these earthquakes is about to be completed. Research of the principles of urban sustainability and resiliency in urban regeneration practices, which are priority issues due to natural disaster risks, has come into prominence. It is important not only to make urban areas more resistant to disasters but also to design according to social, economic and ecological criteria to make more livable. In this study, social, health, green, transportation and educational areas of the first urban regeneration area in Kocaeli were examined in terms of the basic needs of the city. For this purpose, pre and post-project zoning plans are analyzed and transferred to the GIS. The areal changes in the above-mentioned needs are evaluated for changing population density and their sufficiencies are compared.

KEYWORDS:

Geographic Information Systems; Sustainability; Urban Regeneration; Zoning Plans, Natural Disaster Risk.

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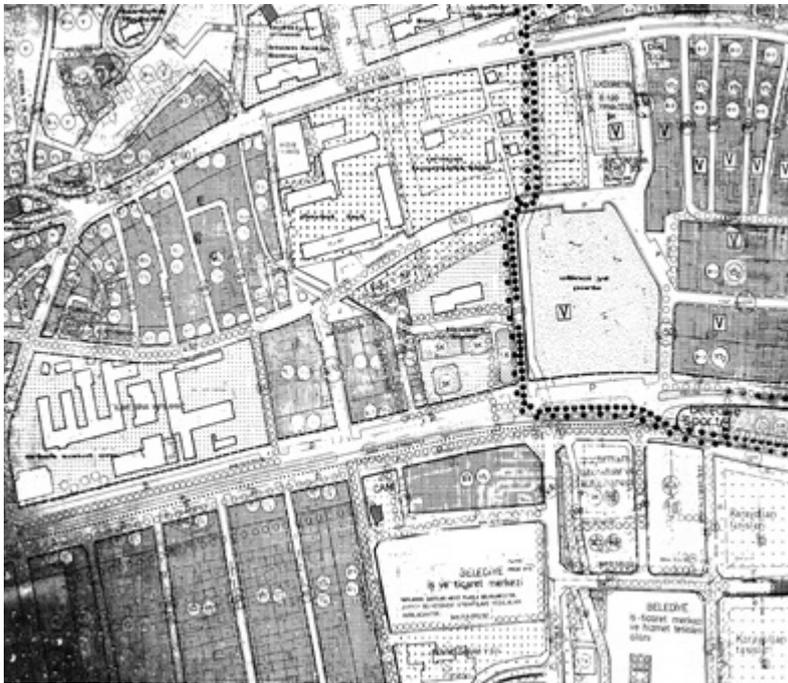
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摘要

工业革命之后，城市的迅速发展已经无法满足当今的需求。此外，地震、洪水等自然灾害和低质量建筑为城市的健康发展带来了负面影响。据观察，土耳其等遭受过大范围灾害的国家在物质、金融和道德领域受害颇深。因此，在经历1999年的格尔居克（Gölcük）地震（7.6Mw）和迪兹杰省（Düzce）地震（7.2Mw）之后，城市改造变得愈发重要。科贾埃利（Kocaeli）是在地震中严重受损的城市之一，其首个城市改造项目于2009年完成。在科贾埃利，很多城市改造项目已经完成并持续进行。由于灾害风险，对城市重建实践中的可持续性原则的审查也变得尤为重要。城市设计不仅要能够抵御灾害，还要满足社会、经济、生态等方面需求，这已衍生为一个重要课题。

该研究将依据城市的基本需求对科贾埃利第一和第二城市改造区（约770000平方米）的医疗、绿化、交通、教育和社会区域进行调查。为此，我们通过向地理信息系统转移的方法，对项目前后的区域划分规划进行分析。根据人口密度的变化对上述需求的区域变化进行了评估，并对其充分性进行了比较。

城市改造区内区域划分规划的变化分析

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关键词:

地理信息系统; 可持续性; 城市改造; 区域划分规划

1. INTRODUCTION

Although natural hazards are unpredictable, the issue of preparing cities for disasters, taking necessary preventions together with laws and regulations, and planning cities in this direction has become an increasingly critical and major subject in our country and the world. A proper urban system is a city that not only supplies the social, economic and environmental needs of the inhabitants but also protects them against potential risks and achieves crisis management in case of a natural disaster or other serious conditions. The concept of resilience is an approach that has emerged to accomplish and sustain such an urban system. There are various definitions of resilience in the literature according to different purposes and different needs of cities (Molavi, 2018; Saunders & Becker, 2015). A resilient city is a city that can have the ability to recover after a disaster, maintain its balance and proceed with its urban activities as soon as possible (Papa, 2012). Essential preventions should be taken to ensure that cities are damage in the minimum possible way from disasters and crises. Resilient cities are planned and developed by considering all these risks and conditions and can use and manage all the required tools within this scope. Major tools for cities to be resilient and prepared for all risks and disasters can be listed as laws and regulations, zoning plans, disaster risk management practices, construction control services, insurances, infrastructure information systems, urban regeneration projects, etc. (Andres & Strappazon, 2011; Benson, 2016; Godschalk, 2003; Meerow, Newell, & Stults, 2016). One of the most effective methods is the urban regeneration projects to reduce risks of the unplanned cities in disasters risk areas. Urban regeneration can be defined as a comprehensive integration of the vision and action to solve the many-sided problems of urban areas that are lacking to improve economic, physical, social and environmental conditions (Ercan, 2011; Zheng, Shen, & Wang, 2014). Increasing energy consumption and carbon dioxide emissions in cities due to increasing population also accelerates the functional, economic and aesthetic aging process in urban tissue. Along with unplanned settlement, urban sprawl causes the destruction of natural areas and deterioration of the quality of environmental life (Mohamed, Baharum, Senawi, & Salleh, 2016; Ulubaş Hamurcu & Aysan Buldurur, 2017). Taking all this into consideration, it has become important to plan cities in a sustainable way and to regulate urban regeneration activities according to the sustainability criteria.

The theme of sustainability is a system including economic competitiveness, the improvement of environmental performance and balanced social integration. In this regard, in order to achieve the ecological, economic and social targets the definition of the participants responsible for continuous control is substantial for sustainability. The private sector, national, regional and local actors and nongovernmental organizations can be considered to be involved in a sustainability issue (Ulubaş Hamurcu & Aysan Buldurur, 2017). The development of urbanization in harmony with environmental principles is directly related to the sustainability of urban planning policies (Hemphill, Mc Greal, & Berry, 2004; Noor, Asmawi, & Abdullah, 2015; Peng, Lai, Li, & Zhang, 2015; Wheeler, 2004). Nowadays, low energy consumption, efficient use of renewable energy sources, compliance with ecological principles of land use, and participation of people in decision-making processes are increasingly important issues to ensure this harmony. Industrialization and development movements are inadequate due to the continuous increase in population; raw material consumption is increasing rapidly and environmental and economic problems are arising. The growing population in cities increases demands on services such as transportation, infrastructure, waste management, and this case causes pressure on urban planning and the environment (Anderson, 2013; Gölbaşı, 2014; Newman, 1999; Nijkamp & Pepping, 1998; Shen, Jorge Ochoa, Shah, & Zhang, 2011).

In the 1950s, the urbanization actions accelerated with the increasing migration from villages to cities in Turkey. The agricultural activities decreased and demand for industrial activities has developed in this period. The increasing population caused unplanned urbanization and the squatters to occur in the cities ((Demir & Yılmaz, 2012; Genç, 2014; Güzey, 2016; Kaya, 1989; Sağlam, 2016). For many years, the governments tried to solve the urbanization problems with various zoning and construction amnesties. However, it can be said

that these amnesties and new laws did not provide enough benefits to cities and they have even made the problems more unsolvable ((Türker Devcigil, 2005; Uzun, Çete, & Palancıoğlu, 2010; Uzun & Şimşek, 2015)). Gölcük (7,4 M_w) and Düzce (7,2 M_w) Earthquakes in 1999 have caused a compulsive awakening in the whole country in terms of urbanization (Tolon & Mızrak, 2017). Especially, these earthquakes caused huge damages to the Marmara Region known as Turkey's industry zone. Kocaeli was one of the damaged cities too. Kocaeli is still one of the most important industrial cities in Turkey and it is located on a zone of high seismic risk. In addition to the urbanization problems that have become totally unsolvable in industrial cities of Turkey, these earthquakes made clear that people and their lives are vulnerable to disasters. As a consequence of all, the urban regeneration idea has become a necessity.

Zoning plans are designed to fulfill the needs of cities for the future with various land use functions ((Demiroğlu & Karakuş, 2012). Zoning plans are critically momentous in the development and orientation of cities in accordance with the principles of urbanization. However, when we look at Turkey, after the 1950s, it was unlikely possible to plan rapidly growing cities in Turkey. Cities developed with their internal dynamics and tried to find their own solutions for the needs of that time. Then, governments tried various solutions with these zoning plan arrangements suitable for these spontaneous urbanization models. These methods which shed no light on the future were also far from adapting to the circumstances of the time. Urban regeneration and legal arrangements provide the opportunity to fully regulate old zoning plans and unplanned urbanization. "The first urban regeneration area" in Kocaeli was announced in order to eliminate housing deficiencies, to increase earthquake-resistant construction and to solve transportation problems by providing access to mass housing constructed after the earthquake. In this study, zoning plans before and after the Gölcük earthquake are compared in "the first urban regeneration project" of Kocaeli. First, briefly, the history of Turkey's urbanization is described and the changes in land use functions are analyzed in a GIS model.

2. THE URBANIZATION HISTORY AND LEGAL REGULATIONS IN TURKEY

Urbanization process in Turkey, despite some differences, is similar to other underdeveloped or developing countries. Until the 1950s, agriculture-based economies generally defined the basis of relations of production in the country. Therefore, until the 1950s, it cannot be mentioned about intense urbanization for Turkey. Nevertheless, for the establishment of the modern city of the Republic of Turkey, Municipal Law No. 1580 was issued in 1930. The Law which was one of the first important urbanization laws of the Republican history mandated the development of zoning plans by municipalities for all settlements which had a population more than 2000 (Resmi Gazete, 1930).

Urbanization has gained momentum with the industrialization movements supported by foreign capital in the 1950s and the investments in major cities of the country. Other factors accelerating urbanization can be listed as the expansion in the road network and transportation facilities, and the opportunities in education and health services in certain urban areas. Immigration from rural to urban areas accelerated, because of the changes in social, political and economic relations in the society. People who migrated from villages to cities firstly built houses called "squatters" on public lands. Squatters were generally lacked infrastructure services such as electricity, water (Genç, 2014; Uzun & Şimşek, 2015). In order to prevent problems caused by rapid urbanization, Zoning Law No. 6785 entered into force in 1956 (Resmi Gazete, 1956).

In the period between 1960 and 1970, it became clear that squatter settlements, which were seen only as construction and sheltering problems, were also a socioeconomic problem. The existence of squatters was formally adopted in the first time by the state with Squatter Law no 775, which was issued in 1966 (Resmi Gazete, 1966). It was aimed to improve the existing squatter settlements and to prevent the construction of new squatters by this law. For this purpose, governments gave title deed to the squatter owners and provided infrastructure services. These applications actually legitimized the squatters and accelerated the construction of new squatters. Because actual socio-economic problems such as injustice in the distribution of income have

not been solved, to solve the squatter problem was impossible. "The amnesty laws" supported the permanence of the squatter problem. Law No. 2981 issued in 1984 was one of "the amnesty laws" (Resmi Gazete, 1984). It was tried to solve the problem by granting ownership rights to those who settled illegally in public areas with this law.

On 3 May 1985, the new Zoning Law No. 3194 entered into force to ensure the convenience of the settlements in urban areas according to planning, science, health, and environmental conditions. With this law, extensive planning and development affairs were enforced in the cities by the municipalities (Resmi Gazete, 1985). Unfortunately, it was impossible to solve the problems of urbanization in major cities by this law completely. As a result, from the 1950s to the 2000s, the social and economic problems caused by the rapidly changing relations of production and the rapid urbanization have not been sufficiently solved, hence irregular and not-resilient urbanization emerged overall the country.

3. LEGAL REGULATIONS IN TURKEY AFTER GÖLCÜK EARTHQUAKE IN 1999

The Gölcük earthquake in 1999 caused a moral and economic collapse firstly but then caused an awakening in the overall country. As a result of this earthquake, 18373 people lost their lives; 285211 houses and 42902 workplaces were damaged (Wikipedia, 2019). These extreme damages have taught the reality which unplanned urbanization puts human life at risk, especially in disaster risk areas. The earthquake revealed that the country was not prepared at a sufficient level for many issues. For example, transportation and telecommunication nets were collapsed. Search and rescue works were inadequate. It was understood that there was no proper insurance system. Generally, emergency legal arrangements were always entered in the force in order to bind up wounds after every earthquake in the country (Şengün, 2007). In this regard, the Decree-Law no 574 was issued, immediately after the earthquake. However, this earthquake affecting the whole of Turkey expressed the necessity of some radical changes for this time. Renewal of urban areas which are collapsed and not resistant to earthquakes became the main topic. There were a few urban transformation projects in Turkey until that day and the projects could usually be applied by special laws. An example was the "Dikmen Valley Urban Transformation Project", which was adopted in 1990 in the capital city, Ankara (Demirci, 2004). Another example was the "Northern Ankara Entrance Urban Transformation Project" implemented with the special law no 5104 in 2004 (Resmi Gazete, 2004). Especially, it can be said that the purpose of the "Northern Ankara Entrance Urban Transformation Project" was a physical transformation. Until that date, there was still no clear legal regulation which defines urban transformation's purposes and control mechanisms. Article 73 with entitled "Urban Transformation and Development Area" of the "Municipal Law" No. 5393, which entered into force in 2005, provided a major expansion. This article authorized municipalities to implement urban transformation in order to rebuild older parts of the city, to create housing, commercial, industrial and social areas, to take precautions against earthquake risk, to preserve the historical and cultural structure of the city. Unfortunately, many projects based on this article have received negative criticisms that urban transformation has diverged from its renewal and conservation purposes. Following the Van earthquake where 644 people lost their lives in 2011 according to Disaster and Emergency Management Presidency (AFAD)(AFAD, 2014), the necessity of regulating a specific law to reduce the losses before the disaster has become the main topic again. Finally, Law No. 6306 on "Transformation of Areas under Disaster Risk" was published on 16 May 2012. This law sets out the principles of improvement, re-settlement, and renewal in order to create healthy and safe living spaces in disaster risk zones (Resmi Gazete, 2012a). Unfortunately, this law has caused many discussions and many of its articles have been rescinded or rewritten.

Besides legal regulations related to urban transformation, some other important regulations have been entered into force after the earthquakes in 1999. "Building Inspection Law" No. 4708 which came into force in 2001 can be given as an example (Resmi Gazete, 2001). The purpose of this law is to ensure the construction of structures conforming to standards for safety of life and property. Also, one of the important regulations is

the "Regulation on Buildings to be Constructed in Seismic Zone" which were arranged in 2006 but entered into force one year later (Resmi Gazete, 2006). This regulation includes many crucial changes to build resistant-constructions against earthquake. Unfortunately, this regulation was started to be implemented in some provinces, and it was decided to implement it all over the country after the Van earthquake in 2011. Another regulation is the decree-law no 587 named as "Compulsory Earthquake Insurance" was entered into force in 1999 (Resmi Gazete, 1999). This regulation was rearranged as "Disaster Insurances Law" No. 6305 in 2012 (Resmi Gazete, 2012b).

4. STUDY AREA

Kocaeli with a surface area of 3397 km² is located in Marmara Region of Turkey. The population of the city in 2018 has exceeded 1,9 million according to the Turkish Statistical Institute (TUIK, 2018). The city is located on an important road connecting Asia and Europe and has a natural harbor; İzmit Gulf which is a busy sea route. Because Kocaeli with important industrial institutions and an advanced economy is one of Turkey's largest industrial cities, pays the most tax contribution in Turkey. According to data from TUIK in 2015, while the average daily income of all provinces is 58 TRY, this value is 85.6 TRY for Kocaeli (TUIK, 2015). However, the earthquake (7.4 M_w) which was the epicenter of Gölcük on August 17, 1999, caused extreme damages in Kocaeli and surrounding cities. A lot of people lost their lives and houses and business sites were damaged by this earthquake. These heavy losses affected the whole country as much as Kocaeli. The restoration of economic and social damages was not really easy. Even it can be said that the earthquake had negative effects on the 2001 economic crisis all over the country. The negative cases have revealed that the government, society and cities should have taken legal, physical and social preventions against natural disasters. After the earthquake, many laws in terms of urbanization and construction have been enacted to prevent and reduce disaster damages. The Decree-Law no 574 was issued on 31.08.1999, immediately after the earthquake. The law has given the authority to determine the new housing areas and to build the mass housing quickly in the provinces damaged by the earthquake to The Ministry of Environment and Urbanization. For this aim, a total of 43053 houses were constructed in these provinces.



Fig. 1 Distribution of mass housing in Kocaeli after Gölçük Earthquake

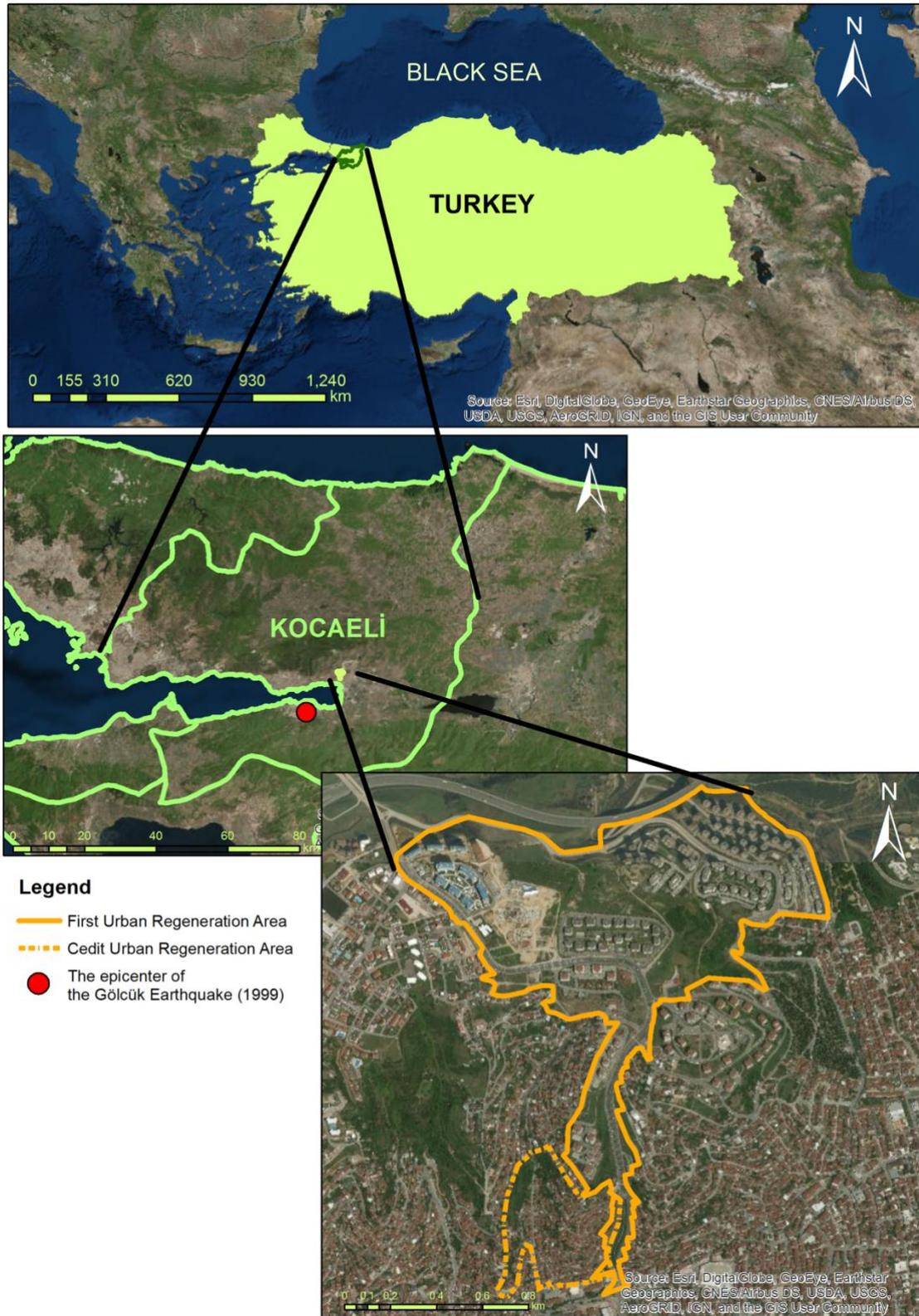


Fig. 2 First Urban Regeneration Area in Kocaeli and Cedit Urban Regeneration Area

The number of houses within Kocaeli province is 17776 (Kömürlü & Öztekin, 2007). Fig. 1 shows the distribution of these houses in Kocaeli. The main elements of this planning can be listed as follows: canalizing cities towards solid ground, reducing the density of old urban areas (Şengün, 2007) solving the sheltering problems, building earthquake-resistant constructions. Despite these optimistic approaches, it should be

known that some new problems had arisen. These problems can be listed as transportation and infrastructure problems, problems with social facilities and creation of new unearned income areas. After two major earthquakes (Gölçük & Düzce in 1999) in Turkey, the processes of urban transformation have been started for improvement of city resilience against natural disasters. In this context, various urban renewal projects have accomplished and continue to be achieved in Turkey, especially Kocaeli. The decision on the practice of the "First Urban Regeneration" in Kocaeli was taken in 2005 and the area was expanded with an additional decision in 2006 (Fig. 2). Because there was no other legal basis for urban transformation in those years, the legal basis of the "First Urban Regeneration" in Kocaeli is Article 73 of The Law No. 5393, named Municipal Law. Following the enactment of the Law on "Transformation of Areas under Disaster Risk" No. 6306 in 2012, urban transformations in Kocaeli have been started to be applied on the basis of this law. Examples of such projects are the Gölçük Denizevler Urban Regeneration and the Cedit Urban Regeneration Projects. According to the decision of the Ministry of Environment and Urbanization in 2015, Denizevler Neighborhood was defined as a risky area based on Article 2 of Law no 6306. For the local people, earthquake-resistant new constructions were built in Sivritepe approximately 3.5 km to the northwest of Denizevler (Fig. 3). The project is about to be completed in 2019. Similarly, Cedit Neighborhood was also defined as a risky area based on Law no 6306 in 2015, but the project has not been implemented yet. The Cedit Project is the neighbor of the study area and is shown in Fig. 2.



Fig. 3 Denizevler Urban Transformation Area and Sivritepe New Houses Area

The study area which is the first urban regeneration area was determined to be about 770000 m² with the final decision taken in 2010. The construction was mostly completed, and the remaining parts are about to be completed by 2019. Fig.2 2 shows the satellite image of the study area. Fig. 4 shows the view of the area in 2007 (left) and 2018 (right). First urban regeneration area is located at the city center. 4626 houses, Training and Research Hospital of Kocaeli University and new campus of the university were built to the north of the project area, after these earthquakes, as shown in Fig. 1.

The zoning status of the project area was generally planned as detached and three-story, before the regeneration. Some buildings were allowed to build two-story. However, as explained in the previous section, it can be said that due to consecutive construction amnesties and shanty settlement, it was not according to the legal situation of construction in the region. As a result, the area is one of the areas that have been built and then subjected to the legal process in Turkey.

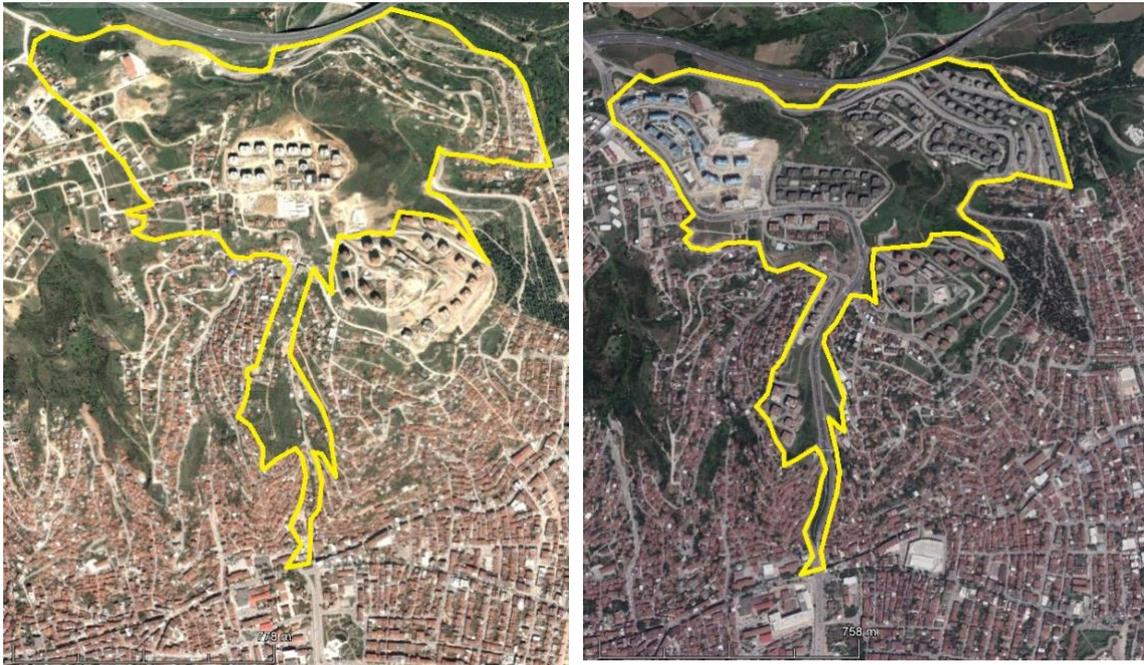


Fig. 4 Study area highlighted with the yellow line, in 2007 (left) and in 2018 (right)

5. ANALYSIS WITH THE DESIGNED GIS MODEL

In the first step of this study, it is aimed to detect the change of different usage functions in the zoning plans, before and after urban regeneration project. For this aim, the old and new zoning plans are transferred to the geographic information system using the ArcMap 10.1. The land use functions in the plans are divided into 11 different classes as shown in Tab. 1. There was no area for the Cultural Facility, the Technical Infrastructure Facility, and the Trade classes in the old zoning plan. It is seen that these classes are included in the new zoning plan after the urban regeneration. On the other hand, it is determined that the area of approximately 1,2 ha, which was excluded of the zoning (non-zoning area) because of geological reasons in the old zoning plan, was evaluated as road and green area in the new zoning plan. Also in the study, the Green Area class in the old zoning plan contains the total of six sub-classes which are the Children Playground, the Area to be Reforested, the Park, the Green Area, the Cemetery Area and the Highway Area. Similarly, the Green Area class in the new zoning plan contains three sub-classes in the form of the Area to be Reforested, the Green Area and the Highway Area. Fig. 1 shows that there is a highway in the north of the urban regeneration area. There are areas that the General Directorate of Highways expropriated and woodland around the highway. For this reason, these areas are included in the Green Area class. The Cemetery Area in the old zoning plan

was designated as a reserve area but was not used as a graveyard in those years. Hence, the Cemetery Area is also included in the Green Area class.

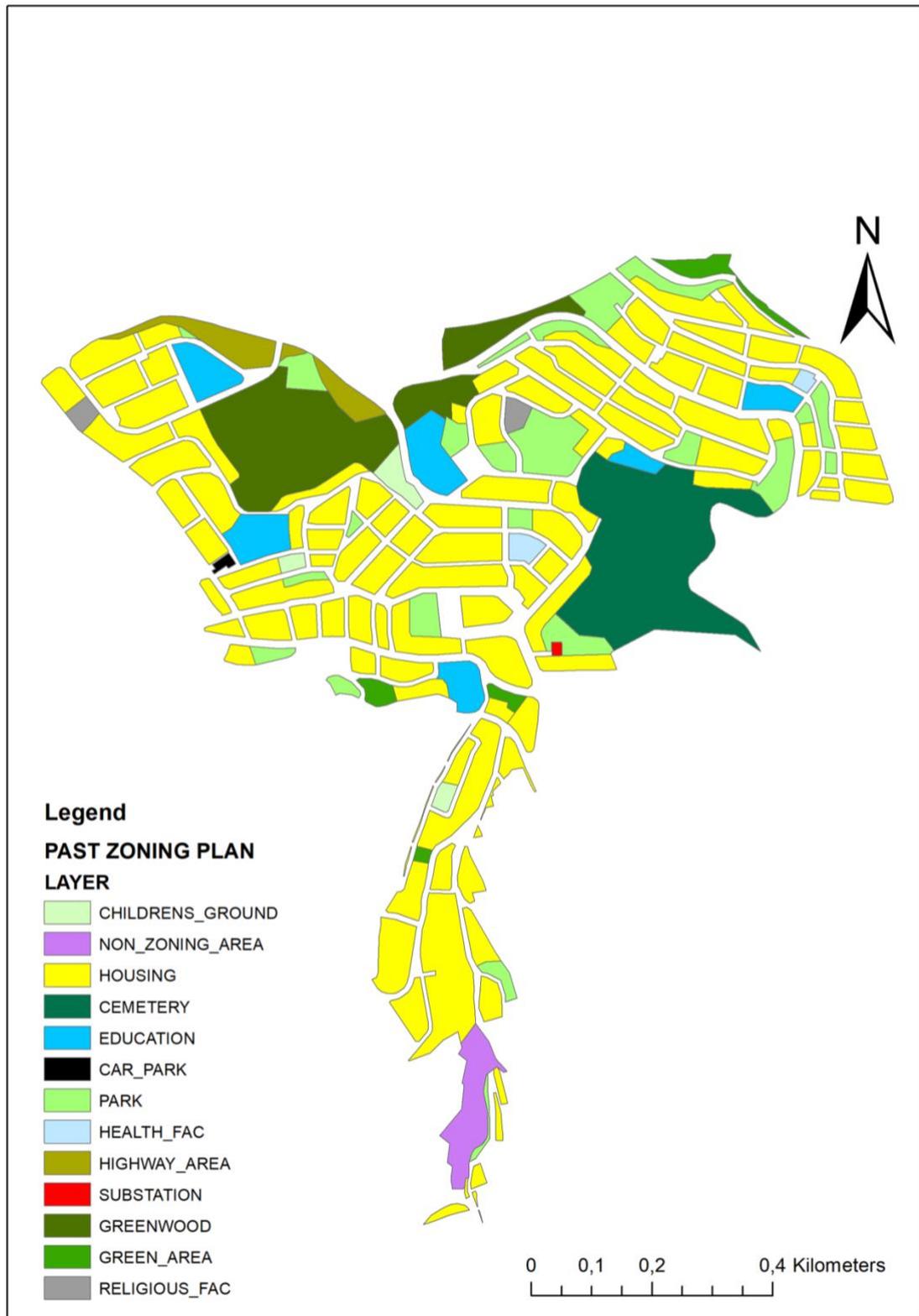


Fig. 5 Distribution of land classes before the urban regeneration

Fig. 5 and Fig. 6 show the geographical information system and the distribution of land classes formed with old and new zoning plans. A graph of the ratio of land classes to the total size of urban regeneration area is given in Fig. 7. It is seen that the percentage of the Housing Areas is preserved as size when Tab. 1 and Fig. 7 are examined. There were 729 parcels in the area before the urban regeneration. However, as can be seen

from the satellite image of 2007 in Fig. 4, it cannot be said that the area had dense housing. The major reasons for this situation are that transportation and infrastructure services were not sufficient. Despite that, it is understood that about 4100 buildings could be built in this area according to the old zoning status. According to 2016 statistics, the average population per household is 3,5 in Kocaeli (TUIK, 2017). In this case, it is predicted that the estimated population of the area could reach about 14500 according to the old zoning plan.

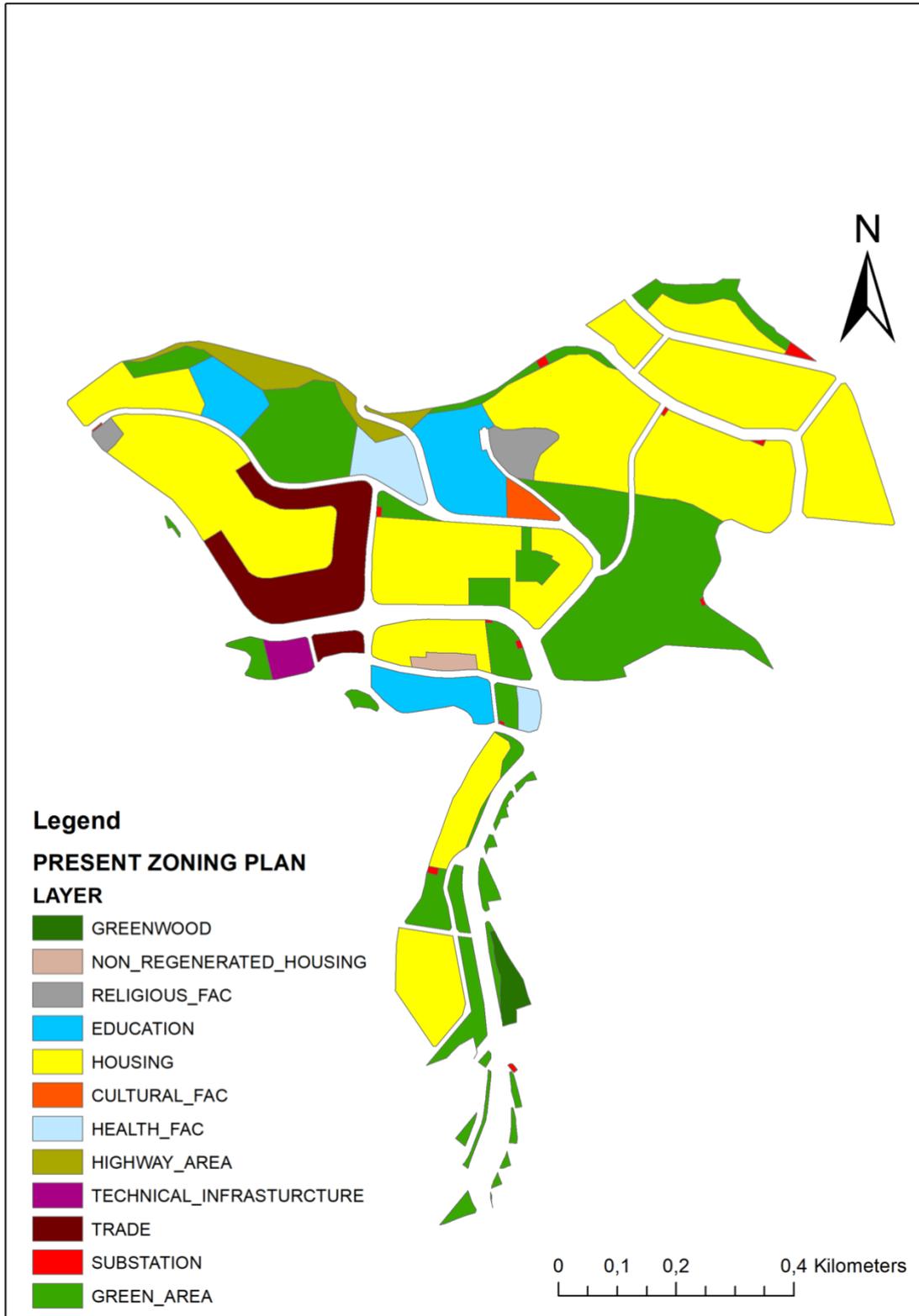


Fig. 6 Distribution of land classes after the urban regeneration

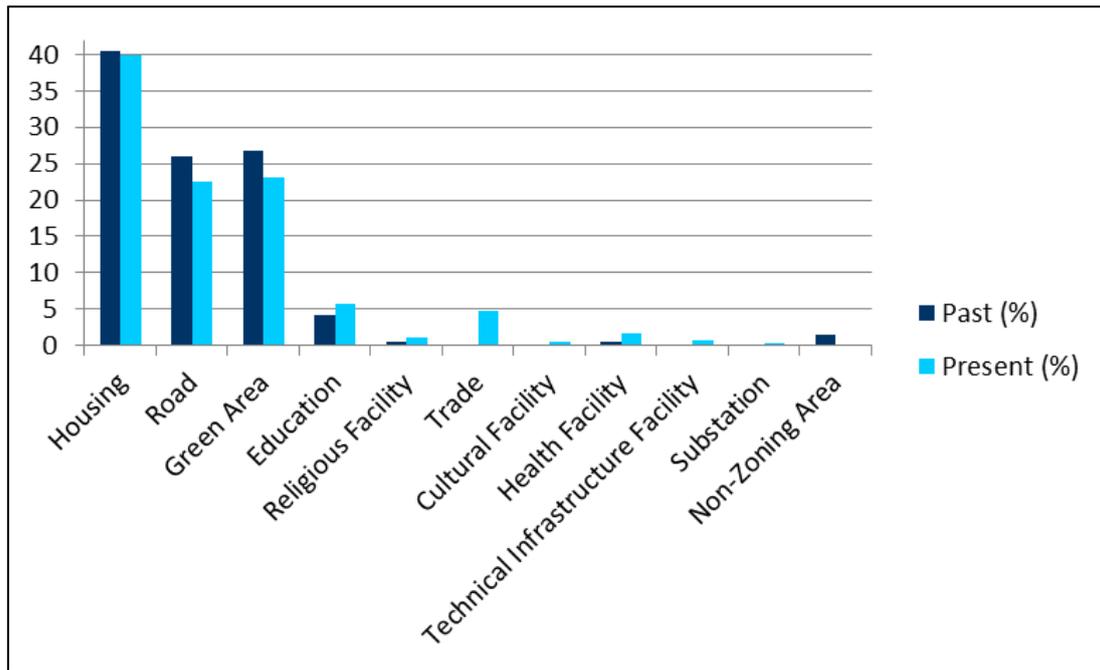


Fig. 7 The ratio of land classes to the size of total urban regeneration area

LAND FUNCTION	PAST (M ²)	PAST (%)	PRESENT (M ²)	PRESENT (%)
Housing	311,383.93	40.50	306,959.45	39.92
Road	199,968.54	26.01	172,637.47	22.45
Green Area	206,318.44	26.83	176,877.24	23.00
Education	32,169.16	4.18	43,633.24	5.67
Religious Facility	3,659.52	0.48	8,788.68	1.14
Trade	0,00	0.00	37,154.60	4.83
Cultural Facility	0,00	0.00	3,575.00	0.46
Health Facility	3,219.62	0.42	12,593.57	1.64
Technical Infrastructure Facility	0,00	0.00	4,625.00	0.60
Substation	372.48	0.05	2,036.42	0.26
Non-zoning Area	11,788.97	1.53	0.00	0.00
TOTAL	768,880.67	100.00	768,880.67	100.00

Tab.1 Changes in land use functions

As a result of the urban regeneration project, a total of 104 buildings were planned in the areas for housing. The construction permission to build has been increased to between 8 and 13 storey in the new zoning plan. When the whole project is completed, the total number of houses will be 4,906. In this case, the population in the area can be expected to be around 17,000. As a result, although there is a slight decrease in housing areas, the estimated population growth rate in the area is 1.17 and this ratio is predicted not to increase the population excessively.

Although the Education areas were 6 parcels before the urban regeneration, there are 3 parcels in the study area after the regeneration. However, it is seen that the Education areas increased 1.36 times. The increase in the area is greater than the possible population increase. In the Religious Facility areas, the number of parcels was not changed at the end of the urban regeneration, while the areas increased 2.40 times. It can be said that this increased rate is higher than the estimated population growth rate. Similarly, while the number of parcels of the Health facility areas remains the same, the increase in the area at the end of urban regeneration is calculated as 3.91 times. In the old zoning plan, the area that determined for the Substation

was only 1 parcel; but 12 parcels are determined for the Substation area which there is an increase of 5.47 times in the new zoning plan. Especially, the rates of increase in religious and Healthy facilities and Substation areas were found to be quite high compared to the estimated population growth rate.

When the changes in Green areas in old and new zoning plans were examined, it is determined that green areas decreased 0,86 times after the urban regeneration contrary to other land use functions. Similarly, there is also a 0.86 times decrease in the roads. Interpretation of these changes in land use functions as only increasing and decreasing will be insufficient for urbanization. The positive or negative effects of increasing or decreasing changes in a sustainable city model should be detected with many parameters.

6. RESULTS AND DISCUSSIONS

Turkey suffered from heavy losses after the earthquakes in the Marmara region and it is understood that the cities were not resilient and prepared for natural disasters. For this purpose, various preventions on the subjects such as laws and regulations, zoning plans, disaster risk management practices, construction control services, insurances, and urban regeneration projects have been implemented after 1999. However, there have been various differences and disruptions in the implementation of these preventions among cities. For example, the "Building Inspection Law" No. 4708 was not implemented throughout the country until 2011. It is also known that some buildings are still not sufficiently inspected according to this law. Similarly, insurance of structures against natural disasters is compulsory according to Law No. 6305, but insurance process could not be extended throughout the country. In addition, this law is used to warrant only material damages after an earthquake. Whereas, this law should also guarantee the financing of the projects to reduce damages before natural disasters.

The primary goal in many urban regeneration projects in our country has been to produce earthquake resistant mass houses. Resilient and sustainable urban designs have turned into secondary goals. Therefore, urban regeneration projects have been frequently observed in areas where there are no settlements. Such projects can be interpreted as opening new areas for settlements or creating new unearned income areas. In recent years, urban regeneration applications have been accelerated in areas under disaster risk or in areas where disaster risk structures exist according to the law no. 6306. However, there are still many areas and constructions under disaster risk in our cities. The number of earthquakes ($M_w > 6.0$) in The Marmara Region have been 17 in the last 400 years. In addition, according to scientific studies, the probability of a major earthquake in only the Marmara Region for the next 30 years is about 50% with an optimistic perspective (Bohnhoff et al., 2013; Murru et al., 2016; Paradisopoulou et al., 2010; Parsons, 2004). Therefore, it is urgent to regenerate the areas under disaster risk as soon as possible.

Until the earthquake, Kocaeli has continued growth of along the seashore. There have been many reasons for this situation from the past to the present. These reasons can be listed such as the rugged topography outside the coast, the factories, and seaports located along the coast and the country's main railway and highway transportation line at the seashore. In general, because the ground along the coast is not suitable for the settlement, earthquake damages have occurred in these areas mostly. It was aimed for deceleration of spontaneous growth of the city immediately after the earthquake. For this purpose, the largest of the mass housing areas were built in Kocaeli under the decree-law no 574 is in the northern part of the city center. Total of 4626 houses was built in the northern part for disaster victims (Kömürlü & Öztekin, 2007). In addition, Training and Research Hospital of Kocaeli University and new campus of the university were built to the north of this area as shown in Fig. 1. This planning and structuring raised the problem of transport between the city center and the north of the city. The project, which is discussed in this study is the first urban regeneration project in Kocaeli after the earthquakes in 1999 and it is about to be completed now. The basic aim of the project was to establish a transportation system between the city center and new northern settlements and to support the development of the city towards the north. This purpose was provided with Gazanfer Bilge

Boulevard, which is an important artery as shown in Fig. 3. Other objectives of the project were to build earthquake-resistant structures in the project area and to perform more resilient and sustainable planning for the project area.

It can be said that there are significant improvements in the functions of Education, Religious, Cultural, Health Facilities, Trade, Technical Infrastructure, and Substation after the regeneration when the analysis mentioned in Chapter 5 is interpreted. This case is an indicator of sustainability which explains the increase of access to education, health and infrastructure services for the dwellers in the area. There is a 0.86 times decrease in the roads, which does not actually mean that transport services are getting worse. The old transport network consisted of narrow streets ranging in width from 6 to 12 meters in the area. Although the area is 2.5 km away from the city center, it had difficulties in transportation. This is why the area was not preferred for settlement before the urban regeneration project. A 30-meter wide boulevard and a 20-meter wide street constructed after the regeneration provide access to the north of the city as well as the area. The expansion of roads will also be able to provide significant contributions to search and rescue operations during natural disasters. On the other hand, the slope in the new boulevard is up to 15% due to topographical difficulties. This situation brings some risks to transportation. As a result, it is not enough to interpret roads only through areal size changes. Similar discussions can be made for a 0,86-times change in green areas. The advantages or disadvantages of the newly designed green areas compared to the old ones should be revealed with many parameters. For example, the pros and cons of the change in green areas should be discussed according to flora and fauna or the usage of children, elderly people, young people, etc. before and after the regeneration. For this reason, it is a necessity to analyze all this information of the settlement in terms of resiliency and sustainability with GIS models. GIS constitutes the first phase of the study. It is aimed to analyze the sustainability of each of the land use functions with various parameters in future studies.

From past to present, it is a certain truth that the various zoning and construction amnesties cannot solve the problems of urban sprawl in Turkey and especially in industrial cities such as Kocaeli. For this reason, Law no. 6306 on Transformation of Areas under Disaster Risk which went into effect in 2012 is an important step towards providing more modern and healthy living areas to cities and people although it has caused many controversies. The urban renewal projects in Turkey have been the subject of various discussions for these aspects since then. Displacing people from their habitats, forcing them to live in high-rise buildings, or getting unearned incomes through constructions are the main topics of the discussions (Demirkol & Bereket Baş, 2013). The pros and cons of urban renewal projects should be made analyzable according to many parameters. The importance of Geographic Information Systems is undeniable for monitoring, analyzing or establishing new models of the effects of spatial changes on the sustainability and smartness processes. The main thing is that not only the reconstruction of habitats but also the changing land functions can be monitored, analyzed and improved.

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IMAGE SOURCES

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Fig. 3: Image is obtained from Google Earth.

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Fig. 5: Generated by authors using ArcMap 10.1.

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IMPACTS OF LAND DISPUTES ON COMMUNITY DEVELOPMENT

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ABSTRACT

Land disputes as experienced in different parts of Nigeria have strong effect on rural and urban socio-economic development. Land disputes have disastrous and life threatening effects on individuals as well as on groups, communities and even entire nations. The goal of this study is to investigate the impacts of disputes on land in relation to human capital and infrastructural development of communities. In view of this, the study examined the specific impacts of land disputes on the development of communities in Inyimagu district. In achieving this, Three hundred and Seventeen (317) questionnaires were retrieved from the residents of the various villages that make up Inyimagu community in Ikwo local government area of Ebonyi state Nigeria, a community that has been ravaged by communal clashes with the adjoining villages including Nsobo community in Obubra local government area of Cross River state over the issue of land ownership. Data were analysed using a simple descriptive statistics. Finding shows that village claim of long time settlements, long-term enmity amongst families among others factors are the major reasons for the incessant land disputes in these communities. The study will contribute to the knowledge of understanding the major factors responsible for land disputes in rural communities and the effects of such disputes to the socio-economic growth and development of the effected communities.

KEYWORDS:

Dispute, Land, Land in dispute, Land Ownership, Land use Act.

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城市改造区内区域划分规划 的变化分析

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摘要

本文旨在通过梳理智慧城市文献资料，实现所述目标。通过对150多篇文献资料进行查阅和分析，发现智慧城市各大驱动因素和成功指标，供未来研究政策所参考。研究结果指出了促使智慧城市形成的几大因素。这些驱动因素涉及经济、环境、治理、安全、能源、生活、科技、建筑、教育和人员。有趣的是，一座智慧城市的划分，应取决于该城市达到的智慧程度是否满足这些驱动力的要求。也就是说，智慧城市是以自身的智慧经济、智慧环境、智慧治理、智慧安全、智慧能源、智慧生活、智慧科技、智慧建筑、智慧教育、智慧人员为特征的城市。本文通过阐述与成功的智慧城市相关的各大驱动因素和指标，为智慧城市的研究文献做出了贡献。本文旨在通过梳理智慧城市文献资料，实现所述目标。通过对150多篇文献资料进行查阅和分析，发现智慧城市各大驱动因素和成功指标，供未来研究政策所参考。研究结果指出了促使智慧城市形成的几大因素。这些驱动因素涉及经济、环境、治理、安全、能源、生活、科技、建筑、教育和人员。有趣的是，一座智慧城市的划分，应取决于该城市达到的智慧程度是否满足这些驱动力的要求。也就是说，智慧城市是以自身的智慧经济、智慧环境、智慧治理、智慧安全、智慧能源、智慧生活、智慧科技、智慧建筑、智慧教育、智慧人员为特征的城市。本文通过阐述与成功的智慧城市相关的各大驱动因素和指标，为智慧城市的研究文献做出了贡献。

关键词:

地理信息系统; 可持续性; 城市改造; 区域划分规划

1 INTRODUCTION

The Nigeria Land Use Act of 1978 highlights the constitutional right of every eligible person to own land and in any place that does not contribute negatively to his or her development as long as they follow specified guidelines. The 1978 Land Use Act vests all land in the Governor of each state of the federation to hold in trust and administer for the people. It provides that land may be administered under two tenure systems: statutory and customary tenures. While statutory land is administered in accordance with written laws, by government officials, customary land is administered by traditional authorities based on unwritten and localized customary laws in certain places in Nigeria.

It is generally said that "all development starts and remains on land", as such efforts to develop a town or community should be well planned and integrated to be meaningful and useful to the people. The continuous growth in world population and the associated changes in lifestyle call for a need to examine current trends in land issues, which also include land disputes. Dispute or conflict is a phenomenon that cannot be avoided in human interrelationship with each other. Social, economic, religious and political issues are agreed to be at the heart of the source of human disputes. That is, differences in interest on these issues can cause conflict of various natures. Land disputes often have extensive negative impacts on economic, social, spatial and ecological development of any nation. This is especially true in developing countries and countries in transition such as Nigeria, Ghana, Cameroun etc., where land market institutions are very weak, opportunities for economic gain by illegal action are widespread and many poor and deprived people in the society lack access to land. Land disputes have disastrous and life threatening effects on individuals as well as on groups, communities and even entire nations (Wehrmann, 2008). It also affects city growth and development. Therefore, issues of land disputes should thus be handled with utmost care as land is noted to be a primary resource that men and women in most communities in Nigeria depend on for their livelihood and social economic growth and development. Mudenda (2006) supported this assertion and stated that "Land is a source of food, shelter, social status and power". It is on the basis of these that this study is meant to investigate the impacts disputes on land has on human capital and infrastructural development of communities under study. Since creation of the earth, and from one generation to another generation, land has been held as the greatest resource and indeed the backbone of wealth in many African communities, whether in towns or in rural communities. Land is known to be the focal point of economic growth, poverty eradication and the general improvement of livelihoods, (Government Gazette, 2004). Similarly, to the investor, land is the basis of wealth creation; to the peasant and commercial farmer, a basis of production and to the community, a source of pride and social status. Land is a vital natural resource that hosts and sustains all living things namely; plants, animals, man and infrastructure. It is a fixed socio-economic asset that aids production of goods and services and hosts virtually all activities that take place on earth (Magel, 2001). The above mentioned arguments reveal that land is central to continuity of life, indispensable in physical development and complex in social relations of production in the economic world. In other words, to every land, there is the socio-cultural dimension to it. As a result, dispute over land is often combined with strong economic, spatial, cultural and emotional values. There are indications that man's complex socio-economic, cultural and physical attachments to land have placed land in a sensitive and unique position. Many countries of the world, especially developing countries in Africa have experienced severe problems relating to land. The most prevalent ones include environmental degradation, landlessness, squatting, and rural poverty (Kambenja, 1997). The U N in addition argues that, one of the major land issues is dispute resolution, which if not addressed can lead to serious underdevelopment. The major problem associated with land dispute is the loss of lives and properties. Disputes on land often occur between individuals, groups and communities. Dispute on land in recent years have done more havoc than good to the 21st century generation (Ukaejiofor, 2009). Dispute on land often truncate the socio-economic and physical development of most urban and rural areas leaving the dwellers with economic hardship, poverty accentuation, health challenges, food scarcity, low standard of living, slow city and

community growth among others. It has been observed in studies that land disputes often result into several deaths and severe injuries during conflict battles especially in situations where it is a communal dispute (Fischer, 2012).

Presently, there have not been any clear terms on how to resolve land disputes in Nigeria especially between villages, towns and cities despite all the provisions in the existence of land use Act and all other efforts by the government. Communal conflict which relates mostly to land issues still dominates southern and middle belt parts of Nigeria. The need for arable land for farming and rearing of animals has increased over the years giving room for conflicts and land disputes. Irrespective of the efforts of the federal, state and local governments towards resolving land disputes, little results have been achieved as land disputes is common in villages, towns and cities, particularly in the villages who equates land possession as wealth and inheritance rights (Fischer & Ferlie, 2013). There is no doubt that the problems associated with incessant land disputes could hinder the growth and development of villages, towns and cities such as Inyimagu town and its adjoining localities. The growth of the town in terms of community infrastructures, housing development and business activities have been seriously affected by crisis associated with land disputes. Businesses are often shut down during crises in the town and this usually leads to loss of lives and valuable goods, it also leads to increase in food prices, high cost of living, unstable society, slow execution of building projects, non maintenance of community infrastructure, damage of community facilities etc.

Despite the prevalence of research in the context of land and associated disputes, the impacts of land disputes on community development has not been sufficiently covered as it affects land dispute in Nigeria. This study thus aims at providing valuable feedback on land dispute studies as well as contributes to the knowledge of understanding the major factors responsible for land disputes in rural communities and the effects of such disputes to the socio-economic growth and development of the effected communities.

2. LITERATURE REVIEW

2.1 DISPUTES IN LAND

A dispute, as defined by sociologists, is a social fact in which at least two parties are involved and whose origins are differences either in interests or in the social position of the parties (Imbusch, 1999). Consequently, land conflict can be defined as a social fact in which at least two parties are involved, the roots of which are different interests over the property rights to land: the right to use the land, to manage the land, to generate an income from the land, to exclude others from the land, to transfer it and the right to compensation for it. A land conflict, therefore, can be understood as a misuse, restriction or dispute over property rights to land (Wehrmann, 2005). The dimensions of land disputes vary significantly. Banette and Jan (2008) observed that a difference is found in the identity of the actors involved. They stressed that some of them being legitimated to Act in the way they occur, others are not. They further noted that land disputes are found in the land itself which are mostly on the basis of ownership such as state, private or commonly owned land. Understanding the specific nature of the land dispute is a vital step in knowing its effects on the growth and development of the affected area.

2.2 GLOBAL CONTEXT OF LAND DISPUTE

Globally, disputes in land are common in virtually all societies. In an ideal society, institutions and transparent procedures can be put in place to resolve such disputes or at least lead to a process that minimizes their possibility of resulting violent disputes. However, it is observed that in societies that are characterized by insecurity of interests, inequality and weak institutions, such disputes may be aggravated through sheer neglect or predatory and discriminatory policies (Chipo, 2016). Land disputes are becoming more intense and diversified world over. However, it should be noted that land dynamics are context specific and continuously

changing, and such disagreement related to them do not systematically result into violence. The consequences of these disputes are far reaching and multidimensional in outlook and may include strong negative effects on social, economic, political and ecological development. These effects are high in developing countries, where land governance is weak, land markets are poorly developed, where there is widespread corruption and political patronage and where many poor members of the society lack access to land (Wehrmann, 2008).

Talking about land disputes around the world, the list is long, endless and ever-changing in nature. Conant (2014) observed that there are more than 150 existing disputes that involve territory, mostly in Africa, Asia, and the Pacific region, but also in Europe and the Americas. Generally, land disputes manifests in different forms, which ranges from disputes between individual parties (such as boundary lines, conflicts between neighbours), conflicts between communities, states or nations, inheritance (conflicts between siblings) and disputes over the use of a given piece of land. Koelmann et al (2018) noted that land conflicts have become a major issue for governments in meeting renewable energy policy objectives in Netherland.

2.3 LAND DISPUTES IN NIGERIA

Issues of disputes surrounding land in Nigeria are multi-faceted and highly complex, with dynamics that change from time to time and depending on the part of the country where they occur. To understand land disputes in Nigeria, especially those that result in violent crises that affects city growth and development—one must understand various types of land disputes found in the country and examine the historical context in which these disputes originated and the current environment in which they continue to thrive. Gausset et al. (2005) observed that “the same territory, landscape or resource can be perceived very differently by different people, and what has been interpreted as dispute over scarce resources often appears to be dispute of perspectives, over the definition of resource, and over the resource management rules.”

Drawing from the above statement, this paper seeks to go beyond Malthusian and Neo-Malthusian concepts of population growth and increasing scarcity as the primary driver of land and other resource disputes, and instead examine the “impacts of land disputes on the growth and development of Inyimagu Nigeria.” Again Gausset et al. (2005) opined that “looking at disputes through the lens of political ecology, one can see that disputes over resources are often due to distribution, management, and control, rather than scarcity”. Another school of thought held that “with regards to natural resources and conflict, relative abundance of a resource (including land) may lead to conflict. This is generally referred to as the “resource curse” an idea championed by scholars such as Ross (1999) and Mehlum (2008). In the Nigerian context, Quentin Gausset (2005) argues that the abundance of natural resources in the Adamawa region of north-western Cameroon and south-eastern Nigeria “has never prevented the existence of agro-pastoral disputes, just as it has never prevented tenure disputes among farmers or among herdsmen”.

When northern and southern Nigeria was merged by the British in 1914, the dominant ethnic groups in each region were confronted with an influx of people from other regions of the newly formed country as migration increased dramatically. In an effort to discourage ethnic clashes in northern cities, the British and the emirs persuaded Igbo and Yoruba people to live in separate parts of the city known as Sabon-Gari or stranger’s quarters. “By cobbling the different Nigerian groups into a culturally artificial political entity, the British stimulated inter-group competition and mobilization for power and resources in the new state.” The ethnic and political structures imposed by the British set the stage for decades of conflict in Nigeria.

In South West Nigeria when land grabbing is brought to the front burner, only one name comes to mind, the Omoniles. Omoniles are known to dispossess people of their property in the most crooked means possible. They foment chaos in the affected communities/area and carry out their heinous crime as if they are above the law. As their activities continue to escalate, it is sad to note that the arm of the law hardly catches up with them. Taking control of large extents of land, territories and related rights is a problem regardless of who takes it. The population of Nigeria, which continues to increase at an alarming rate with the corresponding

rapidly growing rate of urbanization as a result of the influx of a great number of people into urban areas, worsens the case of land grabbing. Nigeria has continually witnessed an increasingly urbanised and urban oriented society characterized by a daily influx of people of different tribes into major Nigerian cities since 1960. The resultant effect of such is increase in the value of land especially in the Nigerian cities of Lagos, Port Harcourt, Abuja, Onitsha, Warri, Ibadan, Awka and Calabar, among others.

Invariably, land has become gold and acquiring a plot of land in any of the aforementioned cities is not a walk in the park, whether by legal or illegal means. Land litigation has incited attacks – both spiritual and physical causing loss of lives and properties. The only thing some Nigerians want to do is control the sales of land whether by hook or crook and that is why Omoniles have continued their criminal activities with no holds barred. Their wanton display of violence on unsuspecting victims is a source of concern.

According to a report from one of the bulletin of Nigerian Institution of Estate Surveyors and valuers, average property in Maitama costs about N430 million. In Port Harcourt, the city adjudged to be the most expensive property location in southern Nigeria, the average property in this location costs about N150 million. The case of Lagos, the nation's commercial nerve center, is well known. What oil is to the people of the Niger Delta is what land is to the people of Lagos state. To s the least, the average property in Ikeja GRA area, which is occupied majorly by expatriates and wealthy Nigerians who prefer the low-key life, goes for about N250 million. Nonetheless, the good news in all of these is that a bill for a law to prohibit forceful entry and occupation of landed properties in Lagos state, is being planned for passage and observers are of the opinion that other states in the country will emulate Lagos State.

Studies revealed that a major factor of communal conflicts in most parts of Nigeria, particularly in the south east and middle belt zones is land or boundary disputes. This shows that land is becoming a very scarce factor of production either due to population pressure, land alienation or concentration of land in a few hands (Dunmoye, 2003). The study further observed that "Communal conflicts in Nigeria have been exacerbated by the economic crisis and pauperization of citizens in recent times. Factors that account for these conflicts are numerous. These include ethnicism, religious differences and their manipulation, land hunger and bourgeoning population, chieftaincy disputes and the native/settlers syndrome.

Soon after Nigerian independence in 1960, the young Country witnessed years of turbulent conflicts between the primary ethnic groups; the first Nigerian Democratic structure was overthrown in 1966, and the Nigeria-Biafran War of 1967 lasted two and a half years and claimed over one million lives; After which there arose inter-ethnic clashes around the country which have continued ever since. In the northern and the middle belt regions of the country, other than the Islamist uprising of Boko Haram, the region is dominated by clashes between Fulani pastoralists and farmer groups and sporadic inter-ethnic clashes in most cities and rural communities; in the southern region of the country, the fight is between the oil companies and local communities, that has spawned a number of rebel groups including the Bakassi Boys etc. (Idemudia, 2006). In most cities and towns around Nigeria, youth groups known as "area boys and others with different names" are causes of urban violence, destruction and crime.

According to the Nigeria Watch database, the country as a whole has witnessed 11,640 violent deaths and destruction of unquantifiable number of properties as at mid-2014. Obasanjo (2004) justifying his reason for imposing state of emergency in plateau state stated that "Violence has reached unprecedented levels and hundreds have been killed with much more wounded or displaced from their homes on account of their ethnic or religious identification. Schooling for children has been disrupted and interrupted; businesses have lost billions of naira and property worth much more destroyed." Similarly in a Distinguished Annual Lecture presented to the National Institute, Kuru, in 2002 former Head of state, General Ibrahim Babangida observed that *"the overall consequences of contemporary ethnic nationalism consist of the following among others; wastage of enormous human and material resources in ethnically inspired violent encounters, clashes and even battles; threat to security of life and property and disinvestments of local and foreign components with continuous capital flight and loss of confidence in the economy; the heightening of fragility of the economy*

and political process.” Also, in a research report presented by Participants of the Senior Executive Course No. 26 of the National Institute, the economic consequences of religious and communal conflicts were noted as follows: *“In addition to the irreplaceable loss of lives, losses in terms of property (goods, houses, business premises) have not yet been fully ascertained. Some survivors have permanently lost all they laboured for in their lives. As a result, one can safely argue that the aggregate of such instances negatively impact on the overall economy of these communities and by extension, the rest of the country. New armies of the unemployed, the destitute and highly aggrieved are added on the streets with its attendant consequences. Victims are also generally male and belonging to the economically active segments of the society”* (NIPSS, 2004).

Fabusoro et al. (2008) stated that land issues are a leading cause of conflict in Nigeria. They further noted that “access to land has been shown to be important to poverty reduction, economic growth, and the empowerment of the poor”. In addition, they opined that “the importance of territory is perhaps why land disputes are so prevalent in the country, and why they are more difficult to solve than other disputed issues”. On the other hand, Olabode and Ajibade (2010) argued that timing of dispute resolution is very crucial in that “if two adversaries are unable to settle their territorial dispute early, the resulting dispute is likely to last for several years.” It is understandably that if a dispute lasts for several years, a legacy of conflict is constructed and entrenched that makes any type of peace building effort much more difficult if not impossible. Nigeria as a country has passed through decades of land disputes, and the number of people dying and properties destroyed because of such continues to grow year by year. This has largely affected the rate at which Nigeria cities particularly in the north grow and develop. Conclusively, evidences showed that the major causes of land disputes in Inyimagu and other adjoining villages relates to claims of long time settlements on land, long-term enmity amongst families, scarcity of arable lands for farming among other factors.

3. METHODOLOGY

The research methodology adopted for this study was through collection of primary data from Inyimagu community in Ikwo Local Government Area in Ebonyi state, Nigeria which has been having inter-communal conflict among the neighbouring villages within the town and the neighbouring Cross River State. Available literature on recent communal conflicts in the study area revealed that the thirteen (13) districts that make up the study area have experienced one form of inter- communal conflicts or the other. Most of these conflicts are related to claims of ownership of agricultural farm lands in the area. Farming is the major occupation of the people of Inyimagu, Ikwo with the area known for the cultivation of a variety of crops such as rice, yam, cassava and palm wine in substantially large quantities. Information revealed that there were 13 political districts in Inyimagu (Census of Federal Republic of Nigeria, 2006). These include Agbaenyim, Akahufu, Akataka, Amuna, Effie Mgbobo, Ibem, Obegu, Ochoku, Odumowo, Ofenekpa, Oferekpa, Ugwueke and Ugwuenyim. The community is located on 6° 3' 11" and North 8° 10' 46" East with estimated density of 492.9/km² comprising 99,855 males and 115,114 females (NPC, 2016). The study purposely selected 390 household heads (30 in each district) in that up Inyimagu town for questionnaire distribution using systematic sampling method. The reason for making an equal selection was because it is assumed that the populations of the districts are same. In conducting the survey, each district is divided into clans (group of people living together). One out of every 5 compound buildings in each clan was selected using random sampling method. Where buildings were not accessible by road, minor roads or paths that served them were taken as accessible roads for the purpose of the study. In order to ensure a random start, the first building in every road within each clan was randomly chosen out of the first five Residential buildings. Where a chosen building was not used for residential purpose, the next one was selected to replace it. Household heads were targets of questionnaire administration in each of the sampled buildings. Information collected from them were on causes of past inter-communal land disputes in the area, their opinions on effects of land disputes on city growth and

development, strangers right to land and predominant land uses in the study area among others. In a compound where there were more than one household heads, the eldest one with longest time of stay was selected. In all, 390 questionnaires were administered out of which 317 (81%) were valid and worthy for analysis in this study (This is shown in Tab.1 below). This placed non-response rate at 18% of the targeted respondents who were either nursing the wounds of past disputes in their hearts or not willing to supply information related to issues of land dispute in the study area. Information obtained from the respondents were mainly related to main causes of communal land disputes and the effects of these on city growth and development. Data collected were analysed using descriptive method.

Selected Districts	Number of questionnaire Administered	Number of questionnaire Retrieved	Percentage of questionnaire retrieved
Agbaenyim	30	23	5.9
Akahufu	30	25	6.4
Akataka	30	21	5.5
Amuna	30	28	7.2
Effie Mgbobo	30	26	6.7
Ibem	30	22	5.6
Obegu	30	24	6.2
Ochoku	30	25	6.4
Odumowo	30	26	6.7
Ofenekpa	30	24	6.2
Oferekpa	30	23	5.9
Ugwueke	30	25	6.4
Ugwuenyim	30	25	6.4
TOTAL	390	317	81

Tab.1 Sample Frame and Size of the Study Area. Source: Author's field survey data, 2018

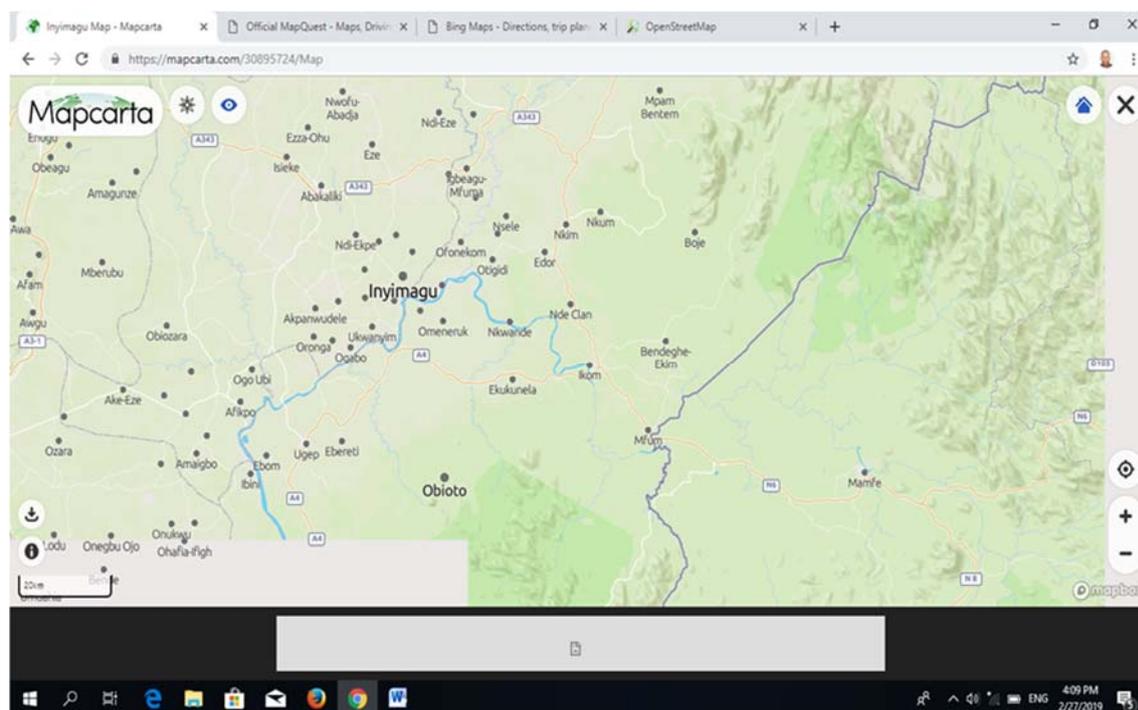


Fig.1 showing the location Map of the study area and communities affected by dispute

Districts	Reasons for Land Dispute						TOTAL
	Excessive greed for money	Self-interest by the elders in the families	Long-term enmity amongst families	Claim Settlements	of Rights over Land	Other Issues	
Agbaenyim	3 (13)	2 (8.7)	4(17.4)	5(21.7)	9(39.1)	0(00)	23(100)
Akahufu	2(8)	2(8)	5(20)	8(32)	8(32)	0(00)	25(100)
Akataka	3(14.3)	1(4.8)	5(23.8)	6(28.6)	5(23.8)	1(4.8)	21(100)
Amuna	2(7.1)	3(10.7)	8(28.6)	7(25)	6(21.4)	2(7.1)	28(100)
Effie Mgbobo	4(15.4)	2(7.7)	7(26.9)	9(34.6)	4(15.4)	0(00)	26(100)
Ibem	3(13.6)	2(9.1)	6(27.3)	5(22.7)	5(22.7)	1(4.5)	22(100)
Obegu	1(4.2)	4(16.7)	5(20.8)	8(33.3)	6(25)	0(00)	24(100)
Ochoku	2(8)	4(16)	6(24)	6(24)	7(28)	0(00)	25(100)
Odumowo	3(12.5)	2(7.7)	4(15.4)	7(26.9)	8(30.8)	2(7.6)	26(100)
Ofenekpa	3(12.5)	4(16.7)	9(37.5)	5(20.8)	5(20.8)	0(00)	24(100)
Oferekpa	4(17.4)	2(8.7)	6(26.1)	7(30.4)	4(17.4)	0(00)	23(100)
Ugwueke	1(4.0)	4(16)	7(28)	7(28)	3(12)	3(12)	25(100)
Ugwuenyim	3(12)	1(4)	5(20)	8(32)	6(24)	2(8)	25(100)
TOTAL	34(10.7)	33(10.4)	77(24.3)	88(27.8)	76(24)	11(3.5)	317(100)

Tab. 2 Land as the Main Cause of Disputes in Inyimagu, Ebonyi State Nigeria. Source: Author's field survey data, 2018

3.1 LAND AS THE MAIN CAUSE OF CONFLICTS IN INYIMAGU, EBONYI STATE

Activities and various interests subsisting on land are the major causes of dispute in the study area and their degrees of occurrence are as shown as follows. Findings revealed that disputes in Inyimagu, Ebonyi State Nigeria were caused by land related issues. As seen in Tab.2, attempts by the natives to claim their communities' rights on land from those who are perceived to be non-natives constitute the highest percentage (27.8%) of the six variables considered to be the main cause of conflicts, and have resulted in conflicts between them and other communities. Also seen in the table, results shows that long term enmity amongst families (24.3%), Rights over land (24%), excessive greed for money (10.7%) and self interest by elders in the family (10.4%) are some of the factors that causes conflicts in the study area. The table further revealed that (3.5%) of the respondents had a contrary opinion to the effect that past conflicts in the study area could be linked with other issues different from land matter. The results further indicated that most of the recorded past conflicts in the various communities had some issues undertone other than land related matters. The import of this is that most disputes in Inyimagu were instigated by tussles over land matters.

Districts	Owner-ship Determination			TOTAL
	Family & individuals	Village heads	Government	
Agbaenyim	17(73.9)	1(4.3)	5(21.7)	23
Akahufu	21(84)	0(00)	4(16)	25
Akataka	19(90.5)	1(4.8)	1(4.8)	21
Amuna	24(85.7)	2(7.1)	2(7.1)	28
Effie Mgbobo	21(80.8)	3(11.5)	2(7.7)	26

Ibem	20(91)	0(00)	2(9.0)	22
Obegu	24(100)	0(00)	0(00)	24
Ochoku	16(64)	2(8)	7(28)	25
Odumowo	18(69)	2(7.7)	6(23.2)	26
Ofenekpa	22(91.7)	1(4.2)	1(4.2)	24
Oferekpa	21(91.3)	0(00)	2(8.7)	23
Ugwueke	19(76)	2(8)	4(16)	25
Ugwuenyim	22(88)	0(00)	3(12)	25
TOTAL	264(83.3)	14(4.4)	39(12.3)	317(100)

Tab.3 Those responsible for Land Administration, management and Allocation in Inyimagu. Source: Author's field survey data, 2018

3.2 SYSTEM OF LAND ADMINISTRATION, MANAGEMENT AND ALLOCATION IN INYIMAGU, EBONYI STATE

The study showed that land in Inyimagu, Ebonyi state Nigeria is principally owned and administered by the family rather than the government. As revealed in Tab.3, 83.3% of the respondents indicated that family or individual members of the community are in charge of their land administration, management and allocation. Only 4.4% and 12.3% of the respondents opined that village heads and government respectively are in control of land in the study area.

Districts	Land ownership			TOTAL
	Non-natives have no full right over Land Ownership	Non-natives can be given partial rights	Anybody can have full right over land	
Agbaenyim	0(00)	11(47.8)	12(52.2)	23
Akahufu	0(00)	6(24)	19(76)	25
Akataka	0(00)	10(47.6)	11(52.4)	21
Amuna	0(00)	6(21.4)	22(78.6)	28
Effie Mgbobo	0(00)	4(15.4)	22(84.6)	26
Ibem	0(00)	8(36.4)	14(63.6)	22
Obegu	0(00)	5(20.8)	19(79.2)	24
Ochoku	0(00)	5(20)	20(80)	25
Odumowo	0(00)	4(15.4)	22(84.6)	26
Ofenekpa	0(00)	6(25)	18(75)	24
Oferekpa	0(00)	5(21.7)	18(78.3)	23
Ugwueke	0(00)	4(16)	21(84)	25
Ugwuenyim	0(00)	10(40)	15(60)	25
TOTAL	0(00)	84(26.5)	233(73.5)	317(100)

Tab.4 Mode of Land Ownership in Inyimagu. Source: Author's field survey data, 2018

3.3 PREDOMINANT MODE OF LAND OWNERSHIP IN INYIMAGU, EBONYI STATE IN NIGERIA

There are various modes of land ownership in Nigeria as outlined on Tab.4 above. The styles of ownership differ from one community to another but the above classified styles are the predominant manner in which one can own land in the study area. As revealed in this study in Tab.4, about two third (73.5%) of the respondents were persuaded that anybody, be it a stranger or a native can have full right over any piece of

land in their community provided such right is legally acquired from the legal owner even without a certificate of occupancy issued by the government. Only 26.5% of the respondents in all the communities that make up Inyimagu are of the view that strangers should be given partial right of ownership in their respective communities. None (0 %) of the respondents are of the opinion that non-natives should have right of land ownership in the study area. The import of this is that most of the sampled respondents were of the opinion that strangers have right to own land in the study area since ownership is based on individual family members who has an unrestricted right to sale or alienate any part of his land at any time without permission from anybody.

Districts	Effects of land disputes			TOTAL
	Loss of lives & properties	Close down of social services such as Schools, hospitals & churches	Loss of economic activities such as farm lands & businesses	
Agbaenyim	12(52.2)	4(17.4)	7(30.4)	23
Akahufu	14(56)	1(4)	10(40)	25
Akataka	10(47.6)	2(9.5)	9(42.9)	21
Amuna	10(35.7)	5(17.8)	13(46.4)	28
Effie Mgbobo	16(61.5)	3(11.5)	7(26.9)	26
Ibem	14(63.6)	1(4.5)	7(31.8)	22
Obegu	15(62.5)	3(12.5)	6(25)	24
Ochoku	7(28)	5(20)	13(52)	25
Odumowo	12(46.2)	1(3.8)	13(50)	26
Ofenekpa	13(54.1)	5(20.8)	6(25)	24
Oferekpa	11(47.8)	3(13)	9(39.1)	23
Ugwueke	5(20)	4(16)	16(64)	25
Ugwuenyim	4(16)	3(12)	18(72)	25
TOTAL	143(45.1)	40(12.6)	134(42.3)	317(100)

Tab.5 Main effects of land disputes in Inyimagu, Ebonyi State. Source: Author's field survey data, 2018

Findings from the study revealed that land disputes in the study area have caused several damaging effects. This is evidenced in Tab.5 which shows that 45.1% of the respondents attested that land disputes in the study area have led to loss of lives and valuable properties. It further revealed that it has led to loss of economic activities such as farm lands & businesses (42.3%) and close down of social services such as Schools, hospitals & Churches (12.6%). The import of this is that economic, social and other activities are affected by crises that arose as a result of land dispute in the study area.

S/N	Impacts	SA	A	UD	D	SD	TOTAL
1	Increase in food prices	189	97	5	20	6	317
2	High cost of living	212	85	11	5	4	317
3	Unstable society	267	44	3	2	1	317
4	Decay of community infrastructures	217	78	7	12	3	317
5	Slow down projects development	292	16	-	7	2	317
6	Damage of community and individual properties	309	5	1	1	1	317

7	Displacement of inhabitants from their communities	302	9	3	2	1	317
Total		1788	334	30	49	18	2219

Tab.6 Socio-economic Impacts of Land Disputes on the Development of Inyimagu. **Source: Field survey, 2018**

Note: SA = Strongly Agreed, A = Agreed, UD = Undecided, D = Disagreed = SD = strongly Disagreed

Tab. 6 Computation for mean rating. The rating of the impacts of land disputes in Inyimagu, Ebonyi state is hereunder computed for mean rating. The mean rating is used to make decision concerning respondent’s agreement.

Impacts of land disputes	SA	A	UD	D	SD	TOTAL	Mean	Rank	Decision
1	945	388	15	40	6	1394/317	4.39	7	Agreed
2	1060	340	33	10	4	1447/317	4.56	5	Agreed
3	1335	176	9	4	1	1525/317	4.81	4	Agreed
4	1085	312	21	24	3	1445/317	4.55	6	Agreed
5	1460	64	0	14	2	1540/317	4.85	3	Agreed
6	1545	20	3	3	1	1572/317	4.95	1	Agreed
7	1510	36	9	4	1	1560/317	4.92	2	Agreed

Tab.7 Computation for mean rating. Source: Field survey, 2018

Note: SA = Strongly Agreed, A = Agreed, UD = Undecided, D = Disagreed = SD = strongly Disagreed

The information contained in Tab.6 above shows that all the 317 respondents agreed that the stated Impacts in Tab.6 are the various impacts of land dispute in Inyimagu, Ebonyi state, Nigeria. This is because the mean score for the responses are above the cut-off point of (4.0).The lowest impact of land disputes in Inyimagu as shown on the list has a mean score of 4.39. This shows that land disputes in Inyimagu has led to an increase in food prices as there is scarcity of food in the town. Item 2 on the table have mean score of 4.56 and this shows that land disputes has impact on the cost of living. The views expressed by most of the respondents during oral interview collaborates this finding. Item 3 with a mean score of 4.81 also show that land disputes affect the societal peace and lead to an unstable society. This explains why communities/villages descend on their neighbours with a slightest provocation.

The mean score of item 4 is 4.56 which bothers on the decay of community’s infrastructure can also be seen as the effect of land dispute in the study area. This is attributed to a total neglect and abandonment of the facilities by both the community and the government. This decay has the tendency to cause ill health and at the extreme cases death of the inhabitants.

Item 5 have a mean score value of 4.85. This signifies that land dispute in Inyimagu has resulted to a slow down of developmental projects such as housing development etc. This is attributed to the fact that investment can only thrive successfully in a dispute free environment.

Item 6 on the table has the highest mean score of 4.95 and this shows that the greatest impact of land dispute in Inyimagu is the damage done to community’s and individuals’ properties in the community. The views expressed by most of the respondents during oral interview collaborates this fact equally.

Finally, item 7 which as a mean value of 4.92 indicates that land dispute in Inyimagu leads to the displacement of inhabitants from their natural and ancestral homes to other neighbouring communities

4. CONCLUSION AND RECOMMENDATION

This paper has analysed vital issues associated with land disputes and which have serious implications on socio-economic development of the study area in particular. Firstly, it provided a basis for understanding the main causes of land disputes in Inyimagu, Ebonyi state Nigeria. The study further revealed the issue of who is in control of land management and administration in the area. The study unraveled the limitations of government both at state and local levels to control the use of land as enshrined in the land use Act of 1978, instead individuals and in some cases families are allowed to be determine who owns the land and for what purpose. Perhaps this lack of centralized control of land led to land fragmentation, making individual members of the community to claim their individuals' community's rights over a given pieces of land, resulting to unresolved disputes.

From the study it can be deduced that nations that have efficient and rigid systems of land administration have less disputes over land. Therefore, from the foregoing it is recommended that the existing land law in Nigeria and elsewhere should be comprehensively reviewed to fashion out a best policy that makes both rural and urban lands to be administered by the government through effective land administration system. In this, way the issue of family land ownership will be abrogated everywhere in Nigeria. In addition, it would address the problem of strangers' inaccessibility to certain categories of land thereby speeding up development of both rural and urban areas. Having this in operation, the craving to associate a piece of land to one's life and the desire to preserve family heritage would be drastically reduced, and in cases of minor issues such boundary matters, government through an established agency will step in for immediate settlement.

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THE TIMES THEY ARE A-CHANGIN' 1(2019)

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Inside the journal the Review Pages have the task of stimulating as much as possible the circulation of ideas and the discovery of new points of view. For this reason the section is founded on a series of basic's references, required for the identification of new and more advanced interactions. These references are the research, the planning acts, the actions and the applications, analysed and investigated both for their ability to give a systematic response to questions concerning the urban and territorial planning, and for their attention to aspects such as the environmental sustainability and the innovation in the practices. For this purpose the Review Pages are formed by five sections (Web Resources; Books; Laws; Urban Practices; News and Events), each of which examines a specific aspect of the broader information storage of interest for TeMA.

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TeMA 从城市规划和流动性管理之间的关系入手，将涉及的论题逐步展开，并始终保持科学严谨的态度进行深入分析。在过去两年中，智能城市（Smart Cities）课题和随之而来的不同含义一直受到特别关注。

学报的最后部分是评述页（Review Pages）。这些评述页具有不同的目的：表明问题、趋势和演进过程；通过突出貌似不相关的学科领域之间的深度关系对途径进行调查；探索交互作用的领域、经验和潜在应用；强调交互作用、学科发展、同时还包括失败和挫折（如果存在的话）。

评述页在学报中的任务是，尽可能地促进观点的不断传播并激发新视角。因此，该部分主要是一些基本参考文献，这些是鉴别新的和更加深入的交互作用所必需的。这些参考文献包括研究、规划法规、行动和应用，它们均已经过分析和探讨，能够对与城市和国土规划有关的问题作出有系统的响应，同时还对诸如环境可持续性和在实践中创新等方面有所注重。因，评述页由五个部分组成（网络资源、书籍、法律、城市实务、新闻和事件），每个部分负责核查 TeMA 所关心的海量信息存储的一个具体方面。

01_WEB RESOURCES

网站报告为读者提供与主题直接相关的网页。

author: Rosa Morosini
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02_BOOKS

书评推荐与期刊该期主题相关的最新出版著作。

author: Gerardo Carpentieri
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03_LAWS

法律部分提供主题相关标准方面的大量综述。

author: Maria Rosa Tremittera
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04_URBAN PRACTICES

城市的实践描述了期刊主题在实践中最具创新性的应用。

author: Gennaro Angiello
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05_NEWS AND EVENTS

新闻与活动部分让读者了解与期刊主题相关的会议、活动及展览。

author: Andrea Tulisi
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THE TIMES THEY ARE a – CHANGIN' 1(2019)

REVIEW PAGES: WEB RESOURCES

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In this number

SOIL USE AND CLIMATE CHANGE

During the Sustainable Development Summit 2015, Heads of State adopted a document called “Agenda 2030” (ONU, 2015), which set the objectives to be pursued by the Member States for sustainable development, in order to mitigate the effects of climate change.

The document recognizes the close link between human well-being and the health of natural systems and its objectives identify several areas of action in this perspective: fighting against hunger, eliminating inequalities, protecting natural resources and claiming sustainable production and consumption patterns.

Human health depends on the ecosystem conditions, which are compromised by human activity (the main cause of climate change). The roles played by air and water to mitigate the effects of climate change are quite known (Reali & Toffol, 2017) but the awareness of the role that soil can play is less widespread.

In fact, soil constitutes the second carbon tank after the oceans (Zucaro & Morosini, 2018) and, as such, it carries out a real CO₂ storage action, contributing to the mitigation of climate change and favoring adaptation to it, without considering that permeable soils protect against heat waves, storing large amounts of water and keeping temperatures low (European Environment Agency, 2017).

The awareness of the multiple functions of soil ensures that one of the objectives set by the Agenda 2030 is “to promote sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally” (Agenda 2030, 2015).

In this context, several European cities are trying to exploit the soil functions: for example, Madrid organized the Gomeznarro park to include new permeable surfaces, vegetation and underground areas for water storage (European Environment Agency, 2017).

Therefore, if properly managed, soil can help reduce greenhouse gases and global temperature and contribute to flood regulation and prevention by reducing erosion.

The solutions adopted in the Belgian village of Velm (Vandaele, 2011), such as rotation crops, to reduce the countless floods that occurred above all in 2002, could be taken as a good example.



CMCC

<https://www.cmcc.it>

The Euro-Mediterranean Center on Climate Change (CMCC) is a non-profit research organization founded in 2005, with the financial support of the Ministry of Education, University and Research (MIUR), the Ministry of the Environment and Protection of the Territory (MATT), the Ministry of Agricultural and Forestry Policies (MIPAF) and the Ministry of Finance (MEF), and thanks to funding from the Integrative Special Research Fund (FISR) within the National Strategic Program for Research.

CMCC's mission is to carry out studies and model the climate system and its interactions with society and the environment, to ensure reliable, timely and rigorous results to stimulate sustainable growth, protect the environment and develop, in the context climate change, adaptation and mitigation policies based on scientific knowledge.

The CMCC website contains a wealth of information articulated in different sections. The home page can be divided into three parts: the left one, where users can find a significant number of links that simply direct to the section of interest and to other similar websites, such as that of the European Environment Agency. The central part, instead, is dedicated to the presentation of the latest articles uploaded on the site; on the right side, then, users can find links for the Newsletter, the box dedicated to the Events and that to the Tweets.

The most interesting sections for the topic of climate change are "Publications", "Events" and "Databases". By clicking on the section "Publications", users will display five sub-sections:

- Scientific and Refereed Papers;
- Research Papers;
- International Climate Policy Magazine;
- Strategic Plan and Reports;
- Books.

In particular, in the first sub-section it is possible to consult papers published by CMCC scientists in journals with Impact Factor identified by the Journal Citation Reports (JCR) by Thomas Reuters, scientific books and proceedings. Through the drop-down menus at the top of the page, it is also possible to make a detailed search by setting filters. Moreover, this section is rich in scientific material on climate change and land use that can be easily and quickly consulted and downloaded. Another sub-section of equal interest for the theme of climate change and land use (with the same consultation structure of the previous sub-section) is "Research Papers", which contains the research documents produced by the CMCC divisions. The texts published in this sub-section can also be found on the Social Science Research Network (SSRN) website in the Public Policy Centers - Research Papers series. From the "Events" section, users can access a full schedule of seminars, conferences and workshops. Each event is associated with a link that leads to the event details, providing information about the contents, dates and place, the organizing body and the related contacts. Finally, another interesting section is the one dedicated to the Databases, in which users can find the climatic scenario simulations conducted by several CMCC researchers. In each section consulted by the users, the news box is always kept updated, so as to make them promptly informed about all the most important initiatives regarding the issue of climate change. The website header stays fixed on the top of the page, whatever section users are consulting: this allows the reader to do a quick search by keywords through the Search box on the top right side, but also to choose the language (the site is available in Italian and English), send an email through the Webmail link and directly access the social networks of Facebook, Twitter, Instagram, LinkedIn and the YouTube channel (right beside the Search box).



CEE web for Biodiversity

[http: www.ceeb.org](http://www.ceeb.org)

CEE web for Biodiversity is a network of non-governmental organizations in the Central and Eastern European region that has been working in 20 countries for 20 years. Its mission is the conservation of biodiversity through the promotion of sustainable development. The website is divided into eight main sections:

- Home;
- About us;
- Members;
- Work Areas;
- Library;
- News & Events;
- Job Offers;
- Contacts.

By entering the "Work Areas" section, users can find the two sub-sections "Working Groups" and "Priority Areas", in turn organized by topics. For example, the "Working Groups" section is divided into four groups: NATURA 2000, Sustainable Tourism, Rural Development, Cities and Policies.

By clicking on the sub-section "Natura 2000", users can access the page created with the aim of encouraging the introduction and management of Natura 2000 in the CEE region; in fact, the group's primary aim consists in the information and experience exchange on the subject. Within the page, users can find several links that give access to various information, such as Meetings, Resources, Members, Activities, etc. By clicking, instead, on the section "Sustainable Tourism", users can access the area dedicated to tourism and biodiversity; in fact, the objective of the Working Group is precisely to make tourism sustainable in the countries of Central and Eastern Europe. In this context, the Working Group contributes to the work of NGOs for the conservation of nature, ministries and other institutions. In addition, users can consult several links in the same page to deepen their knowledge on the subject. The "Rural Development" section is dedicated to enhancing the soil role in the maintenance of valued cultural landscapes, in order to identify the threats that may compromise nature, such as land intensification and abandonment.

The second sub-section of the "Work Areas" section, called "Priority Areas", is divided into ten groups, in turn articulated into sub-groups. The groups of greater interest are certainly those dedicated to green infrastructure, sustainability, use of resources and other activities, which include projects, ideas and insights about climate change. An interesting article on the special role played by soil in the processes of mitigation and adaptation to climate change can be consulted in the area "Other Activities". From the list of titles, users can choose the article of interest and access it with the click of a mouse; scrolling the page down, then, they can freely download the pdf version of the article. As for the previous website, also in this case it is possible to do a quick search by entering keywords in the box located in the upper right corner of the page. At the bottom right side of the home page, there are links to social networks like Facebook, Twitter, LinkedIn and YouTube. This webpage is financed by the European Union, the International Fund and the Ministry of Foreign Affairs of the Republic of Korea

State of the Planet is a blog of the Columbia University's Earth Institute, composed of scholars spread over more than two dozen research centers and programs at Columbia University, whose goal is to spread knowledge about the functioning of the Planet and how human activities are influencing natural systems. The studies published in the blog want to raise human awareness towards a sustainable management of economic growth to protect Earth from destruction.

The website is easy to consult: in the home page are featured the latest news uploaded, while at the top of the page users can find all sections organized by topics:

- Agriculture;
- Climate;
- Earth Sciences;
- Ecology;
- Energy;
- Health;
- Sustainability;
- Urbanization;
- Water.

By clicking on the section of interest, users can access the linked website, with a large number of scientific publications about the topic of the section, ready to be consulted. At the top right side of the home page and of each section, there is a search box, through which, by inserting keywords, it is possible to make a quick search. At the bottom of the pages (always on the right side), there are several drop-down menus that allow users to do a detailed search of the articles of interest, by inserting the topic, the research center, the authors and the year. Finally, at the top right of every page, it is possible to connect to social media like Facebook, Twitter and YouTube.

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IMAGE SOURCES

The images are from: <https://www.cosepercrescere.it/la-desertificazione/>; <https://www.cmcc.it/>; <http://www.ceeb.org/>; <https://blogs.ei.columbia.edu>

THE TIMES THEY ARE a-CHANGIN' 1(2019)

REVIEW PAGES: BOOKS

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In this number

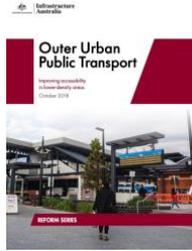
URBAN PLANNING CHANGES

The urban areas around the globe face increasing transport and land-use challenges linked to growing populations and are actively looking to finding potential solutions to meet these challenges as part of their planning agendas. The social and economic growth of cities provides immense opportunities for the nations. As cities grow, businesses take advantage of larger and more skilled labour markets, and workers are given opportunities to develop and broaden their skill base. However, the rapid growth of cities also brings into focus issues with how they are structured and how they function. Most governments are responding to these challenges with significant public investments. Billions of dollars are being spent by all levels of government acknowledging the importance of urban services to the equity and competitiveness of urban areas (Zali et al., 2016). In recent decades, the researchers have concentrated their efforts on design and management solutions that can improve the environmental sustainability of urban and territorial systems (Carpentieri & Favo, 2017).

Plans, strategies, initiatives and solutions of all sorts and sizes are now being developed by hundreds in cities all over the world. Solutions abound; open knowledge, open government, and open source applications have enabled the development of an ecosystem of solutions, platforms and tools that cities can chose (Angelidou, 2017). The ICT technologies, greater availability of data and the emergence of new trends in shared consumption offer the opportunity to break the cycle of under-provision of public transport at the urban fringe. In addition, the integration of land use and transport is critical to ensuring the reach and service levels of our transport networks reflect community needs.

Reduction in car dependency and the growth of public transport use will require strong engagement with the community to ensure their needs are met. Governments should seek the support of communities to undertake reviews of long-established transport services with a view to major changes. Many existing public transport services have not been updated for decades, or worse rely on the corridors of century-old former tram networks. The transport network design and land-use planning should involve a collaborative approach among the different authorities and companies.

According to these themes, this section proposes three works that help to better understand the topics of this number: Outer Urban Public Transport. Improving accessibility in lower-density areas; Autonomous vehicle ride-sharing services; and Environmental and territorial modelling for planning and design.



Title: **Outer Urban Public Transport. Improving accessibility in lower-density areas**
Author/editor: Energy Efficiency Unit Department
Publisher: Infrastructure Australia
Publication year: 2018
ISBN code: 978-1-925352-35-1

Australia's cities are growing rapidly. Over the next 30 years, Australia will grow by over 11 million people. The 80% of this growth will be in the five largest cities: Adelaide, Brisbane, Melbourne, Perth and Sydney. Close to half the population of five largest cities live in the outer suburbs. It is critical that they have access to the services and opportunities that inner-city residents enjoy. Much of this growth will be accommodated at the fringes of cities and in low-density developments. Australia's cities are generally defined by a central core surrounded by low-density suburbs. While they began as small trade and agricultural hubs, usually based around a port, the cities have gradually expanded outwards. This growth was initially along public transport routes. However, in the post-war era, as car ownership grew sharply, the outer parts of cities expanded rapidly. This report focuses on one of the key enablers of access: public transport. It presents a new spatial analysis of our five largest cities in order to: investigate the challenges in delivering outer urban public transport; quantify the extent of public transport disadvantage; recommend a range of policy responses for the government.

This analysis assesses the quality and accessibility of public transport services in our five largest cities: Sydney, Melbourne, Brisbane, Perth and Adelaide. It revealed the extent of disadvantage in some areas compared to others, and the impact on travel patterns and liveability. Two key trends emerged:

- Public transport disadvantage in outer suburbs is significant. Access to public transport services and service frequencies are lower, while travel times and distances to major employment centres are longer in outer suburbs;
- Public transport use is lower for people living and working in the outer suburbs. Fewer people use public transport in outer suburbs than other areas, and those who do are more likely to drive to reach local services. As a result, car operating costs are higher in the outer suburbs.

The report provides seven recommendations to governments on how to improve public transport and accessibility in outer urban areas. Governments have a range of transport and land use options. While building more public transport is desirable and we recommend governments continue investing in new infrastructure, there are other actions that can improve and augment the efficiency of existing networks at a lower cost.

The first, the state and territory governments should prioritize the seamless integration of transport networks for users by coordinating service planning, timetabling, fare policy, digital tools and operations. The second, the governments should embrace new transport modes, such as on-demand services, which are well suited to low-density areas. The third, state and territory governments should implement a coordinated policy approach to encourage interchanging within an integrated transport network. The fourth, State, territory and local governments should improve the physical integration of the public transport network with private, active and emerging transport modes. The fifth, the governments should openly embrace technological innovation in transport, working with third-party operators to improve the user experience. The sixth, governments should undertake integrated land use and transport planning to examine opportunities for employment and residential densification at key sites adjacent to public transport. The last recommendation, governments should support the development and growth of suburban and outer urban employment centres to improve job accessibility.



Title: **Autonomous vehicle ride-sharing services**
Author/editor: MERGE Greenwich Consortium
Publisher: -
Publication year: 2018
ISBN code: -

The urban population increased, cities face the challenge of making sure the availability of transport keeps up with the increasing demand. New technologies, such as autonomous vehicles (AVs), and emerging business models, such as ride-sharing, are often cited as two ways to solve this mobility challenge.

This report collects a year of laborious research, testing, simulations, evaluation, analysis and much more to provide a plan for the delivery of autonomous vehicle ride-sharing services that offer citywide benefits. This contribute provides what to be important insights into the next steps required by the government, operators, tech providers and vehicle manufacturers to drive us forward to a successful future.

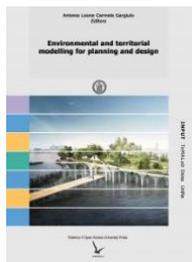
The potential benefits for citizens of new technology and services are huge such that autonomous vehicles and ride-sharing could help to solve many of the most pressing issues faced by cities including congestion, emissions and accessible transport for all. So, this research considers how such services could be commercially launched and the necessary customer service offering required to ensure the delivery of a service that can be trusted by consumers. The Mobility as a Service (MaaS) vision for urban environments sees people shifting away from using personally owned cars in favour of using multiple modes of transport. These involve shared trips, which are consumed as a service through a single, unified digital booking and payment interface acting like a 'personal travel assistant'.

The MERGE Greenwich project brought together a consortium of industry and public sector transport experts to build a sophisticated simulation of autonomous and electric vehicles providing ride-sharing services alongside current traffic patterns in a geo-fenced area.

The aim of this project was to explore how a new service could be designed and implemented to complement, rather than compete with, public transport. A complex transport model and fleet simulation were developed, based on the target year of 2025, which positioned the AV ride-sharing service in the Royal Borough of Greenwich, London. The project explored whether such a service could be viable within that time-frame and, if so, how it could be achieved. It is chosen 2025 as the year in which AV ride-sharing could, theoretically, be widely available, accepted and used in major, complex urban centres. Basing the simulation in this year allowed MERGE Greenwich to evaluate the AV ride-sharing service as if it were an integrated part of the mass transport system. The research methodology, tools and lessons learned by MERGE Greenwich can be applied to other boroughs and cities in the UK as well as overseas.

The recommendations in this report aim to highlight the key considerations for government and industry with regard to the introduction of AV ride-sharing. MERGE Greenwich simulations have illustrated that the way services are designed can significantly influence their societal and commercial impact. For this reason, the suggestion is to accelerate the collective learning in this area in order to ensure that next generation mobility services are developed and delivered in a way which helps, rather than hinders, cities.

Three distinct strategies (AV ride-sharing services) were designed to specify the input parameters. Each service aimed to achieve different objectives from operating an AV ride-sharing service. The strategies differed by fare and service level criteria, such as waiting time and detour time. The first aimed to optimise the service for mass availability and accessibility; the second prioritised customer service and convenience, at higher cost; and the third aimed to combine attributes of both. These strategies and their impact are discussed in detail later in this report.



Title: **Environmental and territorial modelling for planning and design**

Author/editor: Antonio Leone, Carmela Gargiulo

Publisher: FedOA Press (Federico II Open Access University Press)

Publication year: 2018

ISBN code: 978-88-6887-048-5

This book collects seventy-four scientific contributes presented at the tenth edition of the INPUT 2018 conference took place in the city of Viterbo, Italy. The volume is articulate in eight ordinary section (Territorial modelling: state-of-art and future development; Environment, planning and design: the role of modelling; Rural landscapes and well-being: towards a policy-making perspective; Smart planning; Maintenance, upgrading and innovation in cultural heritage; Urban and environmental planners: who is the client? The planners jobs in a new millennium; Big data and data mining; ICT & models: planning for communities;) and in three Special Section (Did we learn lessons? Following the paths of Giovanni Rabino; Ecosystem-based and performance-based approaches for spatial planning; Geodesign).

The INPUT conference is managed by an informal group of Italian academic researchers working in many fields related to the exploitation of informatics in planning. This Tenth Edition pursued multiple objectives with a holistic, boundary-less character, to face the complexity of today socio-ecological systems following a systemic approach aimed to problem solving. In particular, the Conference will aim to present the state of art of modelling approaches employed in urban and territorial planning in national and international contexts. This 10th edition was focused on Environmental and Territorial Modelling for planning and design. It has been considered a fundamental theme, especially in relation to the issue of environmental sustainability, which requires a rigorous and in-depth analysis of processes, a theme which can be satisfied by the territorial information systems and, above all, by modelling simulation of processes. In this topic, models are useful with the managerial approach, to highlight the many aspects of complex city and landscape systems. In consequence, their use must be deeply critical, not for rigid forecasts, but as an aid to the management decisions of complex systems.

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In this number

**CLIMATE CHANGE ADAPTATION: AN OVERVIEW
ABOUT THE ITALIAN CONTEXT**

In 2013, the European Commission adopted the EU Strategy on Adaptation to Climate Change. One of the aims of the EU Strategy is to encourage all the Member States to develop policies and “climate-proof” actions for their territories by the development of National Adaptation Strategies (European Union, 2013).

The National Adaptation Strategy is a document that usually aims at highlighting the importance of the adaptation on the national policy agenda and coordinating the adaptation process in terms of risk and vulnerability assessment, including also awareness and stakeholder involvement. However, in order to guarantee the implementation of the main “climate-proof” policies and actions defined by each National Adaptation Strategy, a further tool – named National Adaptation Plan – has been introduced. In particular, the National Adaptation Plan defines interventions to implement in order to reach the National Adaptation Strategy’s objectives.

To date the majority of EU Member States have developed their own Adaptation Strategy. However, the implementation of these strategies by specific National Adaptation Plans is still in progress. Indeed, although 25 EU countries have adopted a National Adaptation Strategy, only 15 of them have also developed a National Adaptation Plan (European Environment Agency, 2018). Italy is one of the 25 countries that have approved its own National Adaptation Strategy – named National Strategy for Adaptation to Climate Change (SNACC) – in 2015. Despite this, the corresponding National Plan for Adaptation to Climate Change (PNACC) is still being discussed since 2016.

Indeed, the SNACC provides an overview of the national issues due to future impacts of climate change and identifies the necessary adaptation actions to implement in the Italian context.

In light of this, in May 2016 the PNACC was started. The PNACC is the result of a stakeholder engagement that involved institutions, policy makers, experts and researchers in order to identify a set of interconnected activities of adaptation to climate change (CMCC, 2017). It is a support tool for national, regional and local institutions for identifying and choosing the most effective actions to implement at the national, regional and local level in the different Italian climatic areas.

Its main purpose is composed of four specific objectives:

- limiting the vulnerability of natural and socio-economic systems to the impacts of climate change;
- increasing the adaptive capacity of natural and socio-economic systems;
- improving the capacity of taking advantages of any opportunities;
- coordinating actions and interventions at different territorial levels.

The PNACC is divided into three parts. The first part contains an analysis of the current climate conditions in Italy. Starting from this analysis, the Plan also describes the future climate scenarios and provides a mapping of the Italian territory in macro-regions for homogenous climate characteristics. This articulation is integrated to the analysis of territorial characteristics in order to identify the future impacts and vulnerability for each sector that the SNACC has identified as sensitive one to climate change and the PNACC takes into account for the definition of the adaptation actions to implement. Among those sectors, there are also Urban Settlements that are identified as "hot spots" for climate change action. Indeed, due to the urbanization process over the last century, the increasing of the imperviousness degree has contributed to increase the hydrogeological risk in urban areas. Furthermore, the lack of green areas and the high building density have intensified the vulnerability due to the increase of temperature with negative effects on human health. Therefore, the Plan identifies three types of impacts related to the increase in average urban temperature and higher frequency and intensity of heat waves.

The second part of the Plan defines the adaptation actions to implement for each climate-sensitive sector. Starting from the vulnerability assessment for each macro-region and considering the Italian policy context, for each sector, a set of adaptation actions is identified. These actions are articulated into three categories, the green actions that are "nature-based" one interventions, the soft actions that include no-structural interventions and aims at improving the adaptive capacity of natural and socio-economic systems, and finally the grey actions that include all the infrastructural interventions, especially on the built environment. Furthermore, the Plan associates each action with climate impacts, objectives to which they answer, and the main climate macro-regions where they should be implemented. For example, considering the adaptation actions provided for Urban Settlements, the Plan identifies four types of impacts. While the first type includes all the possible impacts that can be mainly faced by the implementation of soft actions (for example, the promotion of scientific research on the drivers and impacts of climate change in the urban context and its risk assessment), the other three types of impacts refer to the built environment and consequently their corresponding adaptation actions belong to the category of green actions. For example, in order to reduce the impacts due to urban flooding, the Plan provides experimental interventions, both in central areas (e.g. historical centres and public spaces), and in peripheral areas that increase the amount of soil permeability and improve the efficiency of the urban drainage system.

Finally, the last part of the PNACC identifies all the tools and the actions for guaranteeing an effective population involvement and stakeholder engagement in the implementation process of the adaptation activities. Furthermore, in this part, the PNACC also defines the criteria for selecting indicators of monitoring of these actions and provides a set of possible monitoring indicators for their evaluation.

Despite the adoption of the SNACC and the PNACC, it emerges instead that the actions in this area are still not widespread in the Italian territory (Pelorosso et al., 2018). Even if the SNACC highlights the need to promote an integrated approach between risk reduction and climate change adaptation, however the policy proposal of climate change adaptation does not seem to be integrated with those related to the mitigation of hydrogeological risk that is widespread on the Italian territory and further exacerbated by climatic variability (Legambiente, 2017).

However, the PNACC represents a reference for the development of new tools, especially at regional and local level. Therefore, starting from the adoption of the SNACC some Italian regions have undertaken individual paths for responding to the opportunity to make their territories more resilient. In particular, in this issue the experiences conducted by the Lombardy Region and the Emilia-Romagna Region. While the Lombardy Region is one of the first Italian regions to develop a Regional Adaptation Plan that provides an important reference for other Italian experiences in progress (e.g. in Abruzzo Region), the Emilia-Romagna Region has recently adopted a strategy that integrates adaptation and mitigation to climate change in a univocal way.



REGIONAL PLAN ON ADAPTATION TO CLIMATE CHANGE IN LOMBARDY REGION

In 2012 the Lombardy Region supported by the Lombardy Environment Foundation (in Italian *Fondazione Lombardia per l'Ambiente*) developed the "Linee Guida per un Piano di Adattamento ai cambiamenti climatici (PACC)". In particular, this document contained all the main information for the definition of a Regional Adaptation Plan of Lombardy. In 2013 and 2014, based on the aforementioned Guidelines, the Lombardy Region drew up the Regional Strategy for Adaptation to Climate Change (SRACC). The Strategy, elaborated in collaboration with the Lombardy Environment Foundation, not only defines the role of the regional institutional stakeholders in the adaptation process by means of specific consultation mechanisms but also illustrates the regional context and its climate profile, including data on the past and the current climate conditions and scenarios on the future climate variability, and vulnerabilities to climate change of eight regional key sectors that include "Built Environment, Environmental Protection, Transportation and Urban Planning".

Starting from these analyses, the Strategy identifies for each one of these sectors adaptation objectives and specific actions taking into account the sectoral and inter-sectoral policies and interventions already undertaken or in progress by the regional administration. Based on the Regional Strategy, in 2015 the Region started to work on the "Regional Plan on Adaptation to Climate Change" that was approved in 2016. The main aim of the Regional Adaptation Plan is to provide a tool based on a mainstreaming approach for defining, from one hand, the priority action areas for each sector in relation to the climate impacts, and, on the other one, identifying interventions that minimize risks and impacts on population, goods and natural resources and increase territorial resilience in a sustainable way. In particular, the actions are defined according to three levels of intervention:

- actions to create appropriate governance conditions for implementing the adaptation process (e.g. laws);
- actions to sustain the adaptive capacity through the dissemination of knowledge and the awareness on climate change impacts;
- actions to provide technical, green and methodological solutions of climate change adaptation.

Considering the impacts, objectives and adaptation actions that were defined in the Regional Strategy, the actions of the Regional Adaptation Plan are organized according to four classification criteria, which are:

- impact relevance;
- consistency and continuity with regional policies that are useful for the adaptation process;
- effectiveness in relation to the objectives of adaptation;
- ecological and economic sustainability (adoption of green, nature-based and ecosystem-based actions).

Furthermore, the actions were also classified according to the time horizon of implementation (shortest term, short term, medium term and long term). These actions are articulated into four macro-sectors, among which there is Environmental Protection and Water Management that includes actions related to Urban Planning. In particular, the Regional Adaptation Plan highlights the need to promote sustainable development of the region and increase its resilience, but also to integrate the interventions for the disaster risk reduction with those ones for climate change adaptation. Therefore, among the priority actions, the Lombardy Region will review the main regional tools for risk management according to the future climate scenarios. Moreover, a resilience and vulnerability index will be developed for monitoring the socio-economic dynamics of the regional territory.



REGIONAL STRATEGY OF MITIGATION AND ADAPTATION TO CLIMATE CHANGE OF THE EMILIA-ROMAGNA REGION

In December 2018, the Emilia-Romagna Region approved the Mitigation and Adaptation Strategy for Climate Change. By means of an innovative approach, this regional strategy provides a regulative framework for the regional institutions, public administrations, and organizations for assessing the effects of climate change in the various regional key sectors.

In particular, the strategy aims at:

- enhancing the actions, Plans, and Programs of mitigation and adaptation to climate change promoted by the Emilia-Romagna Region through the identification of the actions already undertaken at the regional level for the reduction of CO₂ emissions and the adaptation to climate change impacts;
- contributing to the identification of further interventions and actions to implement in the most climate-sensitive sectors according to the mitigation and adaptation purposes;
- defining monitoring indicators (among those already in use by the different plans both for the SEA and for the operational programs of the Structural Funds 2014-2020);
- instituting a regional and local Observatory for monitoring the implementation of the climate change policy;
- identifying and promoting a participatory process that involves local stakeholders in order to integrate the two action fields of adaptation and mitigation into all the regional sectoral policies;
- coordinating local initiatives (that are implemented by municipalities and union of municipalities) in relation to the Covenant of Mayors.

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IMAGE SOURCES

The images are from: Fig.1 https://en.wikipedia.org/wiki/Flag_of_Italy; Fig.2 <https://en.wikipedia.org/wiki/Lom>; Fig. 3 <https://en.wikipedia.org/wiki/Emilia-Romagna>.

THE TIMES ARE a-CHANGIN' 1 (2019)

REVIEW PAGES: URBAN PRACTICES

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In this number

PLANNING FOR DIGITAL TRANSFORMATION AT THE MUNICIPAL LEVEL: TWO CASE STUDIES

Over the past few decades, the challenges faced by local governments have become increasingly complex and interrelated. In addition to traditional land-use regulation, urban maintenance, production and management of services, today local governments must meet with new demands coming from different urban actors regarding resources sustainability (Gargiulo & Lombardi, 2016), social inclusion (Zalii et al., 2016) and economic development (Visnjic et al., 2016).

In this context, many scholars agree that in order to successfully cope with these new challenges, local governments must innovate, become smarter, and capitalize on the emerging opportunities provided by the so called "digital transformation" (Fistola, 2013; Höjer & Wangel, 2015).

Digital transformation can be defined as the application of digital technologies to processes, products, and assets to improve efficiency, enhance value, manage risk, and uncover new opportunities (Heavin and Power, 2018). Digital transformation is a central element of modern business management: firms in almost all industries have indeed conducted a number of initiatives to explore new digital technologies and to exploit their benefits (Matt et al., 2015). While digital technologies are literally transforming the private sector, public local authorities seem to be less prone to embracing such transformation and, for this reason, sometimes they have been called "the dinosaurs of the digital age" (World Economic Forum, 2017). Digital technologies however have the potential to deliver enormous benefits in the public sector, helping local governments to (Bertrand, 2019):

- better understand citizens' needs;
- provide services more effectively and efficiently;
- find new solutions to policy challenges;
- engage with external partners to develop new delivery models and
- commercialize some public services and develop fresh sources of revenue.

An important step to capitalize on the emerging opportunities offered by the digital technologies is to develop a digital transformation strategy, a roadmap defining the steps to follow for successfully embracing new technologies, adopting new approaches to collaboration and partnerships, and making a commitment to address transformation holistically. This contribution presents two relevant case studies of local government that have recently moved in this direction:

- The municipality of Barcelona (Spain) and
- The municipality of Baltimore (US).



BARCELONA

With 1.6 million inhabitants, Barcelona is the capital and largest city of the autonomous community of Catalonia, as well as the second most populous municipality of Spain. The city has long been a leader in the smart city movement. Sometimes ranked number one (Juniper Research, 2017) – and usually in the Top 10 (Eden Strategy Institute, 2018) – it is part of an elite group of intelligent urban-planning pioneers along with such cities as Singapore, Vienna, San Francisco, and Copenhagen.

In September 2016, the Barcelona City Council embarked on an important digital transformation process, announcing that public services must be provided through digital channels from the outset, following new guidelines oriented towards citizens and the use of open standards and open software and in accordance with an ethical data strategy that puts privacy, transparency and digital rights at the forefront. To meet these priorities, the City Council launched the *Digital Transformation Plan*, a strategic document aimed at defining the roadmap that the Catalan city will follow in the forthcoming years to become a world-leader city in providing digital services to citizens, while making government more transparent, participative, and effective. The Plan is structured around seven themes and, for each of them, a detailed operational document has been elaborated between 2016 and 2019:

- *Theme 1: Digital services standards.* This document defines a set of criteria for the development and management of digital services for citizens, in an agile, open and user-centered way. The main idea behind this theme is that public services should be tailored and based on real citizen needs that may change from one citizen to another. In this context, public data are considered a fundamental aspect for better mapping, understanding and integrating citizens' demands and needs in the design and delivery of public service strategies.
- *Theme 2: Technology code of practice.* This measure includes a set of tech policies and directives mandating the use of open standards, open source and ethical data management. It helps municipal bodies in designing, building and buying technology. It's used as a cross-departmental standard in the spend controls process.
- *Theme 3: Agile methods.* This theme has the main objective to provide managers in public municipal bodies with the main principles and practices of agile methodologies. The document demonstrates how the agile life-cycle software development differs from traditional approaches and provides guidelines on how it can be implemented and integrating into existing framework developed by the city to manage public services projects.
- *Theme 4: Technological sovereignty.* This measure puts the concept of technological sovereignty in the spot and talks about data commons, digital rights and free programming. Its main aim is to rethink technology from the angle of the common good. Thus, this theme focuses on the development of digital technologies aimed at involving citizens in the process of decision making. At the same time, it is aimed at reinforcing the practice of open software and open standards, in contrast to the practice of using proprietary software and standards.

- *Theme 5: ICT Procurement Handbook.* This measure defines a new model of relation and partnership with technology suppliers, based on the Code of Technological Practices.
- *Theme 6: Innovative Public Procurement.* This document sets the guidelines for the transformation of procurement to obtain solutions that are tailored to the real needs of society, while helping companies to be more innovative. It regulates public procurement for IT services in a strictly way, as it consider public procurement as the main tools for municipal economic policy.
- *Theme 7: Government measure concerning ethical management and accountable data:* This theme is centered on the idea that Barcelona city residents leave a digital footprint in their everyday lives and this footprint is getting larger and larger, and it can be used for various purposes. It establishes how this resource should be used in a democratic, open, transparent and regulated manner.



BALTIMORE

The City of Baltimore, Maryland is the 30th-most populated and largest independent city in the United States. The city is home to over a dozen of colleges and universities and has a longstanding tradition in innovation politics. However, decades of decentralized information technology management and insufficient enterprise investment has led to a system that struggles to support city priorities and deliver service improvements for both residents and businesses. Furthermore, many of the city's IT capabilities are outdated and lack the modern-day range of capabilities offered by comparable cities. To combat this trend, in 2018, the City of Baltimore has developed this first ever *Inclusive Digital Transformation Strategic Plan*, which details a five-year roadmap to build the city's IT enterprise capability. The Plan is based on three main pillars:

- *Pillar I: Change the IT culture and improve IT services.* This pillar is aimed at developing strategies and implementing programs to create an integrated enterprise that adapts to the changing needs of its citizens and makes the city a better place to live and work. Main lines of actions under this pillar include: i) centralize various IT operations and functions, when appropriate, to reduce cost, improve efficiency and streamline operations; ii) improve training for municipal employees and increase IT staffing levels; iii) establish a structure that promotes cross-agency collaboration, strategic alignment, and continuous change for IT initiatives and iv) integrate software development to strengthen enterprise operations, service delivery, and customer experience.
- *Pillars II: Support and secure critical operation IT infrastructures.* This pillar concerns with developing strategies and implementing technologies that increases the city's ability to fully support employee and citizen's needs, improves the network's infrastructure and expands the city's use of modern and integrated systems. The pillar is structured along three main axis, as follow: i) Cloud Services: increase the use of cloud services to rapidly deploy platforms and software without the need to build physical infrastructure: ii) Data Telecommunications: increase investment in next-generation network infrastructure to connect the city with high-volume, high-velocity data communications that supports demand; iii) Enterprise Resource Planning: develop a modern and integrated system to streamline the complexities of public procurement.

- *Pillar III: Built IT partnerships and increase community engagement around technologies.* This pillar is aimed at developing strategies and implementing programs to improve the city's physical data center infrastructure and handle enterprise needs such as data integration and analytics, IoT-Enabled Smart City, and other mayoral objectives. It focuses on three main domains: i) Data and Analytics Hub: expand the city's capacity to combine data residing in different sources and provide users with the ability to access, use, and benefit from the data; ii) IoT-Enabled Smart City: deploy new technology that improves the quality of life and service delivery for all city residents, businesses and visitors; iii) Baltimore Tech Center: create a physical and virtual space for people to view and experience immersive technology environments and iv) P3 Partnerships: encourage stakeholders in the public, private, education and non-profit sectors to partner with the city and leverage their technology resources for the betterment of all city residents and businesses.

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IMAGE SOURCES

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REVIEW PAGES: NEWS AND EVENTS

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In this number

PLANNING IN AN UNCERTAIN FUTURE

The world is evolving at a rapid pace. Never before we have witnessed so many changes happening in a such short period of time. Economic, social, technological and political shifts are reshaping the world very quickly and new challenges arise for nations and particularly for cities. That's why urban issues have risen high on many agendas that deal with global questions.

If the urban development is so strategic to deal with global issues, it is common to expect that urban planning, supported by the most advanced technology, assumes a central role to face with the new challenges (De Gregorio et al., 2015). Simply postponing action until there is perfect evidence will increase the risks facing urban centers, their populations, industries, and those who depend on them. Planning today therefore requires managing more than in the past the uncertainty inherent in future projections.

In the modern theories of spatial planning uncertainty is related to many different things such as data quality, theory and conceptualization, model formulation, decision making and of course error and risk issues in each of these (Antrop, 2004). Essentially, urban planning is a complex of actions that aim to steer ongoing processes that structure our environment, and so our landscapes. Basically, the actual situation or trends are considered as unsatisfactory and should be improved. Scenarios of the future development can be defined and visions for the future are formulated. Decision-making implies making choices between the possible outcomes that are proposed or expected. As a complex process dealing with a hardly predictable future, a lot of variables and stakeholders, planning implies a lot of uncertainty.

According to Mitchell (2002), adequately dealing with uncertainty is applying the precautionary principle. Synthetic forecasting models, which can be implemented and updated in real time for scenario simulations, monitoring for the verification of the repercussions of the plans and for the calibration of the models, databases suitable for comparing situations and for use in the models, seem to be the most common tools suitable for the formation of plans that are able to indicate strategies and management methods, while maintaining the indispensable flexibility that complex systems with high dynamism require.

After all, uncertainty is in itself also a guarantee of survival; it is an essential part of life and is an essential characteristic in landscape change and planning. According to Saskia Sassen, professor of sociology at Columbia University in New York: "One of the reasons that cities have outlasted all these other more powerful and organized system of power is their incompleteness that gives them a longevity because no tyrant can truly run a city, it's too diffuse – the city will always fight back".



THE PARADIGMATIC CITY (VI): TRANSFORMING CITIES

Where: Istanbul, Turkey

When: 8-10 May 2019

<https://bau.edu.tr/icerik/13322-the-paradigmatic-city-2019>

Cities and towns have not only become the primary human living space, they also live in the collective memory. How do cities respond to the challenges that threaten their ability to become viable pillars of sustainable development? What are the characteristics of future cities? How will urban designers, architects and policy makers reconcile the old with the new, the sustainable and the smart?

The conference aims to question cities, in the past, present and future in an inter-disciplinary approach. Therefore, the cross-topics are selected as city & transformation, city & memory, city & sustainability and city & future. In particular, the cross-topic City & Future presents the following themes:

- Representation of space in the fictional narration
- Digital cities
- Smart cities
- Cities of the future / future of the cities
- Media representation
- City Branding
- Industry 4.0



EURA – UAA CONFERENCE: CITY FUTURES IV

Where: Dublin, Ireland

When: 20-22 June 2019

<http://cityfutures2019.com/>

Taking inspiration from the UN's Sustainable Development Goals the conference topic focuses on the challenges that we are currently facing to create cities and communities that are just, inclusive, safe, resilient and sustainable, while reducing poverty and inequality. Following a decade of crisis and austerity, inequalities are becoming ever more apparent at local, regional and global scales, with our current economic models increasingly being questioned and trust in formal politics declining. Violence and extremism lead to enforced migration and the post war geopolitical map is being shaken. Urban areas are often the sites where the contrasts between wealth and poverty are most stark, where inequalities become expressed spatially, where environmental degradation is most pronounced, and where the disenfranchised and disillusioned look for solutions in entrenchment and fear of 'otherness'.

Despite such challenges, urban areas, as they have been for millennia, are often the fulcrum of hope and innovation. The Conference theme asks scholars to reflect on how we can move towards more socially just, diverse, democratic, environmentally rich cities and city region.



2019 URBAN RESILIENCE SUMMIT

Where: Rotterdam, Nederland

When: 8-11 July 2019

<https://www.100resilientcities.org/summit/>

In July 2019, 100 Resilient Cities – Pioneered by The Rockefeller Foundation (100RC) will bring together the network of urban resilience practitioners from cities around the world in Rotterdam to celebrate the impact of the global movement, share best-in-class practices and innovations in the field, build personal and professional relationships, and identify opportunities for partnerships and collective action. Rotterdam, a city with extensive expertise in building resilience (Errigo, 2018), is the best place to represent a new vision of the future because its core is an incubator of ideas, innovation and experimentation. As a post-industrial portside city in the process of rapid social, economic and physical transformation, Rotterdam provides an ideal setting in which to experience resilience in practice and demonstrates a spirit of openness to fostering critical cross-cultural conversations.



OSLO URBAN ARENA

Where: Oslo, Norway

When: 12-13 September 2019

www.oslourbanarena.com

Oslo Urban Arena (OUA) is a collective of architects, planners, developers and urban activists from a multidisciplinary background with on a mission to launch a conference, debate and lecture arena every year, on urbanism and urban development from the heart of the centre of Oslo.

The conference strive to identify urban solutions connected to a variety of urban topics, pushing the conversation on urbanism forward, shooting out progressive themes and topics. In addition to an extended conference program that hosts renowned speakers, it will also contribute to the public debate on urban development by organizing exhibition spaces. Oslo Urban Arena strives to connect individuals from various backgrounds and disciplines and provides several platforms for them to socialise, exchange ideas and expertise, share experiences and knowledge in the field of urbanism and the interests attached to it.



9TH EUROPEAN CONFERENCE ON SUSTAINABLE CITIES & TOWNS

Where: Mannheim, Germany

When: 30th September – 2nd October 2019

<http://conferences.sustainablecities.eu/mannheim2020/>

Hosted by the City of Mannheim, and ICLEI Europe, the Conference aims to demonstrate the urgent need for local governments to assume responsibility for urban transformation and lead the way in guiding Europe

towards a secure and sustainable future. The conference invite to endorse the Basque Declaration, a document that aims to support and accelerate socio-cultural, socio-economic and technological transformation. It is targeted at city leaders in Europe, including mayors and city governments, and can also be signed by individuals. It outlines pathways to help city leaders shape the development of their own municipalities, and ultimately aims to accelerate socio-cultural, socio-economic and technological transformation. The Declaration is based on the understanding that a diversity of local initiatives is required to address social, environmental and economic challenges. It recognises the importance of things such as protecting biodiversity, decarbonising energy systems, creating more sustainable mobility systems, protecting water systems, adapting to climate change, promoting social inclusion and strengthening local economies, among other things. Although focusing on action at the local scale, the Declaration is underpinned by the idea of cooperation, sharing and replication of solutions adapted to the local context. A strong theme of the Declaration is to have a highly engaged civil society, where participation is a key ingredient in both developing and implementing local transformative actions.

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