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## The City of Matera and the Sassi: Smart Places with a Dantean Attraction

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### 1 ABSTRACT

In Matera, in the course of millennia, there have been favorable and stable conditions that allowed the development of a specific architectural language, juxtaposition of materials, interpenetration of spaces and conformation of volumes, thus creating a unique urban phenomenon. The distribution of similar building artifacts in symbiotic unity with the connective texture of limestone, led to a spontaneous figurative harmonious balance between man and nature that characterizes the building, the techniques distribution and morphological solutions and that is based on a wise use of resources. Certainly, since several years, the Sassi does not longer reserve the experience of a “descent into hell” for those who take narrow streets and steep stairways. The conditions of misery and lack of hygiene described in 1945 by Carlo Levi in his novel “Christ Stopped at Eboli” and, then, the long abandonment and decay of the rupestrian settlement following the displacement of its population, in fact, seem to belong to a very remote time. So, by the end of the forties, critical reading and semantic analysis of the urban complex and environmental structure made up of Sassi and the “murgico” highland was configured as a real construction site of experiments, investigations and research and has involved different disciplines.

The work of geo-geography in the Sassi, that means writing on the ground, in fact, takes on a deep meaning and a great importance given by the complexity of the built environment development in the three dimensions, that determines a unique image of a biunivocal relationship between natural landscape and human settlement.

This complexity reveals itself in a high density of buildings, and then in a clear prevalence of the full on the vacuum, configuring a compact urban space as negative of the built, defined by the complex system of connective elements such as streets, stairways and squares. It is due to this complexity of urban and domestic spaces, tangled one into the other, that the open space of the Sassi assumed a significant role in the development of settlement models. In fact, the urban space of the Sassi is often configured as an extension of the residence in the so called “urban rooms”, with an essential form and enclosed by more housing units, that defines a special type of collective space. It is just for the socializing and community vocation of these places which is possible to prefigure future uses similar to the most modern examples of Social Housing and generally to the Smart settlement models.

The city of Matera, in fact, is going to take action on its neighbourhoods, including “Rione Sassi”, with the project named “Clara” (Cloud platform for Landslide Risk Assessment), who achieved the second place in the final ranking of the call “Smart Cities and Communities and Social Innovation”, issued by the Ministry of Education, University and Research and funded with € 20 million. In addition, the city will also benefit from the project of the Basilicata Region “Smart Basilicata” funded by the same announcement, which will allow a systematic approach to the region as a “city-region”, including the Val d'Agri, Matera and the metropolitan area of Potenza, in order to make it an “intelligent community” through the use of technologies of Information and Communication and participatory planning as part of the most recent paradigm of the Internet of things. There is also a significant experimentation taking place in the Palace “Rione Sassi” of Matera with the first “unMonastery” in the world, co-living and co-working space and place of technological and social innovation, which will accommodate not monks, but hackers, artists, designers and developers throughout Europe. The project, supported by the network of activists Edgeryders and the European Commission, aims to identify sustainable, cultural and smart alternatives, to make the city more beautiful, livable and attractive. It will also support the candidacy for European Capital of Culture 2019 of Matera (entered in the short-list of the six finalists cities), one of the most complex example of redevelopment of urban community and first southern site entered in the UNESCO list.

## 2 INTRODUCTION

When in 1945 the Italian writer Carlo Levi published the book “Christ Stopped at Eboli”, written in the years between 1943 and 1944 during his exile in Lucania ordered by the Fascist regime, the city of Matera and its “Sassi” came finally out by that cone of shadow made by indifference and silence in which they were relegated for years and imposed themselves to the attention of general cultural debate as a “national shame”,<sup>1</sup> becoming the symbol of the poverty and backwardness of rural culture of the South. In the description of the city, trusted to the story of his sister, the writer expressed himself as follows:

“I got there at about eleven in the morning. I had read in the guidebook that it was a picturesque town, quite worth a visit, that it had a museum of ancient art and some curious cave dwellings. But when I came out of the railway station, a modern and rather sumptuous affair, and looked around me, I couldn't for the life of me see the town; it simply wasn't there. I was on a sort of deserted plateau, surrounded by bare, low hills of a grayish earth covered with stones. In the middle of this desert there rose here and there eight or ten big marble buildings built in the style made fashionable in Rome by Piacentini, with massive doors, ornate architraves, solemn Latin inscriptions, and pillars gleaming in the sun. Some of them were unfinished and seemed to be quite empty, monstrosities entirely out of keeping with the desolate landscape around them. A jerry-built housing project, for the benefit, no doubt, of government employees, which had already fallen into a state of filth and disrepair, filled up the empty space around the buildings and shut off my view on one side. [...] But where is the city? I can't see Matera. [...] I set out at last to find the town. A little beyond the station I found a street with a row of houses on one side and on the other a deep gully. In the gully lay Matera. [...] The gully had a strange shape: it was formed by two half-funnels, side by side, separated by a narrow spur and meeting at the bottom, where I could see a white church, Santa Maria de Idris, which looked half-sunk in the ground. The two funnels, I learned, were called Sasso Caveoso and Sasso Barisano. They were like a schoolboy's idea of Dante's Inferno”.

Certainly, today the Sassi does not longer reserve the experience of a “descent into hell” to those who come across the narrow streets and steep stairways. The conditions of misery and lack of hygiene described by Carlo Levi, and subsequently, the long abandonment and decay of the settlement rock followed to the displacement of its population in the fifties, in fact, seem to belong to a very remote time. The transition from the “apocalyptic vision of the city of caves” to the current perception of the “beautiful, picturesque, breathtaking”<sup>2</sup> is, in fact, the result of the continuous work of citizens and years of research by local and international researchers, who have made Matera a real experimentation laboratory on the function of living, based on an use of balanced, harmonious and sustainable development of energy, a virtuous mechanism of social relationships “neighbourhood” and the synergistic sharing and implementation of technologies for communication and information. Today in Matera, in fact, the history and the testimonies of a thousand-year experiment are intertwined with the demand of knowledge to solve critical problems, the innovation and the technological research take advantage of historical knowledge, the protection of heritage becomes strategic to the technological advanced project. Qualities that make it potentially a “smart” city, not so much in relation to the development and use of technologies of sustainability and energy saving, but rather in relation to the development of the idea of “communities” where it becomes vital the ability of the communities to take advantage of the technological quality of the projects put in place.

According to the Italian journalist and writer Luca de Biase, in fact, the smart city can be defined using three metaphors, which represent three critical approaches complementary to the dominant concept of smart city and that give form and structure to the city, creating narrative and operative responses: city as “Ecosystem”, whose center are the places, the life and the social dynamics and whose logic of development is the co-evolution, which directs consciously towards the crucial context of common goods and culture of active participation; city as “citizenship”, in which the city does not emerge without a reflection on smart citizenship, its codes of behavior and on efficiency of city services and their effectiveness in terms of improvement of civil coexistence; city as a “platform”, whose center are information and innovation and whose aim is to connect the parts and manage the flow of information, so that they are favored in their development and use of the digital technology and new generation applications, services and products.

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<sup>1</sup> The definition is given to the leader of the Italian Communist Party, Palmiro Togliatti, in the occasion of his visit to Matera in 1948.

<sup>2</sup> C. Levi, *Cristo si è fermato ad Eboli* (1945).



### 3 AN ANTE LITTERAM BALANCED URBAN AND NATURAL ECOSYSTEM

The Sassi of Matera are a unique testimony of human activity over thousands of years in the Mediterranean, whose “outstanding universal value” is the symbiosis between cultural, environmental and natural fruit of a collaborative process in harmony with the ecosystem.

This concept was at the base of the reasons according to which the Sassi, with their overlooking Park of the Rupestrian Churches of Matera, were recorded in 1993 in the World Heritage List:<sup>3</sup>

(iii) the Sassi and the Park of Matera are a remarkable example of rock settlement perfectly adapted to the geomorphological context and ecosystem through a continuity of more than two millennia;

(iv) the city and the Park are an outstanding example of architectural complex and landscape which illustrates a significant number of stages in the history of mankind;

(v) they represent an outstanding example of a traditional human settlement and land use showing the evolution of a culture that has maintained over time a harmonious relationship with its natural environment.

A “primordial” sustainable economy characterized by a holistic approach to the natural and cultural landscape and a measured respect to the cycles of the elements, which immediately brings to mind the concept of management and operation of energy, admirable in the past, worrying for the future of humanity. In fact, for at least twelve thousand years, men made a wise and intelligent use of locally available resources (water, earth, sun, air), creating a built and excavated city at the same time, with voids cut into the rock and solids made by square blocks consisting of the same rock, the calcareous sandstone, commonly known as “tufa”, since the ninth century, worked and assembled in order to form housing and service facilities (sheepfolds, barns, mills, warehouses and/or grain pits, etc.) which provided shelter to people, animals and things.<sup>4</sup>

In the course of time, and particularly after the sixteenth century, the urban density increases and the Sassi take on the current urban structure. All this is done with sacrifice and with a reduced energy consumption for excavation, transport, edification: the works are provided with a precious intrinsic value, beyond that of representation, that has to be protected and maintained over time.

The site is configured as an outstanding example of bioclimatic traditional architecture in the Mediterranean Basin, where you can find underground dwellings, stone buildings and mixed houses, partly underground and partly above ground, in a unique relationship between nature and artifice, and in a complex structuring of a “layered” and “vertical” city, as more understandable in the section than in the plan, or at least not analyzed regardless of one or the other.

Within the indented area of the “Murgia Lucana”, the urban configuration of Matera has been deeply marked by the geo-morphological conformation of the two crags of the “Gravina” (karstic depressions carved out over the centuries by the water of the streams), for which the city extends along the plateau and its steep edges, sometimes overhanging, and not on the bottom of the canyon as you might think. In fact, where the tufa bed is harder, there are only natural cavities (up to 350 mt), while at the softer layer (between 350 and 400 mt) rise the villages of Sassi “Caveoso” and “Barisano”, characterized by a mesh of settlements and roads made of plazas, terraces, landscaped gardens, balconies, walkways, made in the “tufa”, permeable and prone to erosion by water. And it is the meteoric water the undisputed protagonist, the main source of the labyrinthine complex of the Sassi, who have over ten overlapping layers, connected by wells, tanks, vertical ventilation devices, channels, settling tanks.

Local populations lived and excavate caves for climatic and defensive reasons and to better use the potentialities of the places, pick up the water and protect the soil. The climatic conditions with alternating and catastrophic trend, with rainfall concentrated in a few months of the year and torrid and arid seasons, made necessary an accurate management of the water resource not present in the free state (lake or river), and measures to control the variability in the time and the disruptive effects on the slopes. So it is configured as an accurate network of collection, storage and conveying of rainwater in special tanks dug into the rock (“palombari”), which, through an elaborate system of channeling and drainage, assured the community the

<sup>3</sup> <http://whc.unesco.org/en/list/670/>

<sup>4</sup> L. Rota, Matera. Storia di una città (2011).

water resource for irrigative and productive uses in a first phase, and domestic and sanitary ones in a second phase.

Since the development of the original prehistoric techniques it is so configured in the Sassi of Matera a system of habitat based on the combined use of different principles of production of water: picking-up, percolation and condensation. In the season of heavy rains, terracing and water collection systems protect the slopes from erosion and convey for gravity the water to the tanks, built into a patio, surrounded by collectors wells. In the dry season the inner wall of the excavated cavity, not being exposed to the sun, during the day is at a lower temperature, which causes the condensation of water particles contained in the air. This water accumulates, giving moisture and cooling the environment, which increases the efficiency of condensation. During the night, the process reverses and the cavities function as extractors of atmospheric moisture: the outside of the room is colder and condensation occurs in the exterior surface of the stones.

Thanks to the improvement of living conditions and population increase, slowly begin to configure cave dwellings made from the underground tanks, with long tunnels that penetrate into the rock caves (as if they were the fingers of a hand), proceeding obliquely with a provision in a horseshoe around a central atrium, called the “neighbourhood” (“vicinato”) and with a southern exposure. In this way the central cave, the longest one, by arranging of openings (called “sopraluce”) at the top of the vault, in the winter allow the sun’s rays to infiltrate deep in the rooms to warm and illuminate them, while in summer, the solar light does not directly affect the terminal part of the built environment so it remains cool and moist. Such structures are characterized by a series of bioclimatic strategies, so for this reason, thanks to the presence of natural ventilation and constant seasonal temperatures, they are able to ensure conditions of comfort, especially during the summer season.<sup>5</sup>

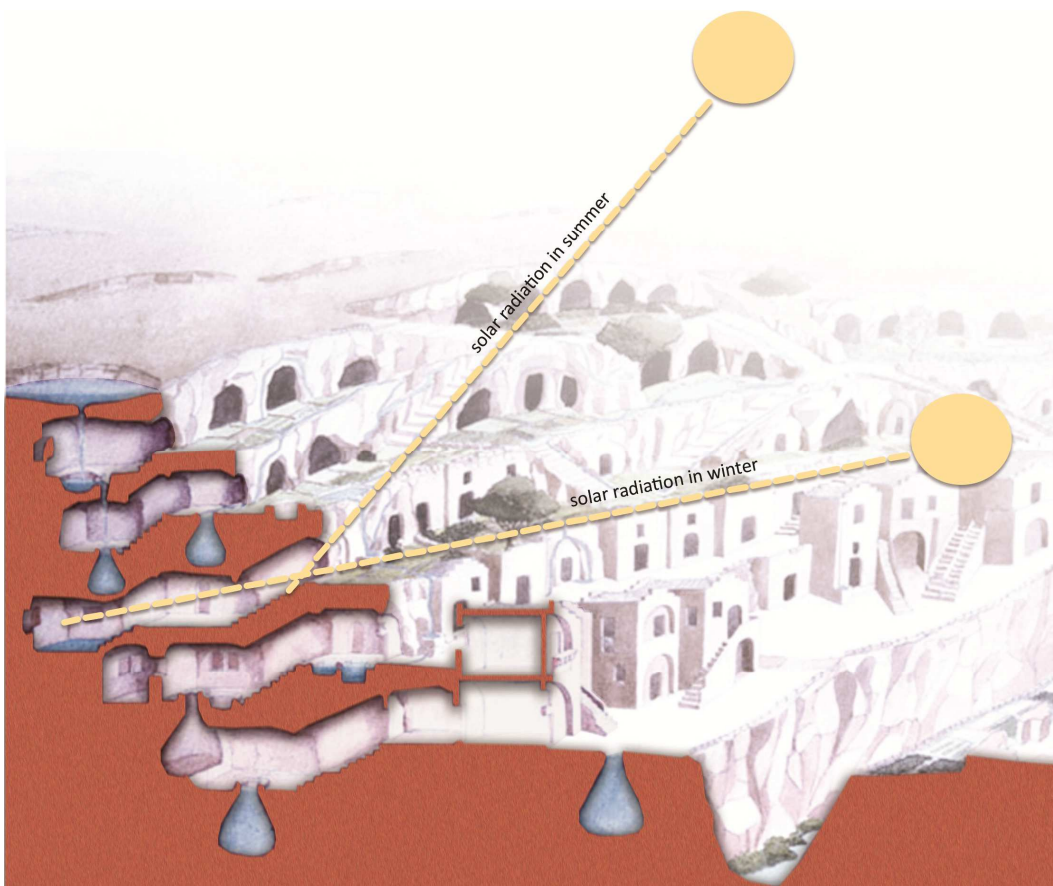


Fig. 1: Bioclimatic strategies in the Sassi (drawing by P. Laureano, reworking of the author)

In the course of time, then they began to determine, in addition to the caves, forms and types of built architecture, for examples real houses with walls and roofs: there were basically extensions and/or prolongations of the caves themselves, consisting of the material obtained from the excavation, which was used to provide the residential unit of a curtain wall at the entrance and to coat the internal cavity in the form

<sup>5</sup> P. Laureano, *Giardini di pietra* (1993).

of a barrel vault. These basic cells, called “lamioni” were thus formed by a very simple rectangular plan determined by a precise ratio, obtained thanks to the so-called “law of the fourth”, and for this reason the walls had to be thick at least a quarter of the light of the arc. In practice it was a “built” cave, independent and leaning against the initial cave bounded by two thick walls of “tufa” connected with filling material to contain the forces of the vault, and with openings, providing access and lighting, practiced on the short side, with no load-bearing function.

This complex and articulated mechanism has survived, with pain, fatigue and suffering for many centuries, settling itself and assuming an irreproducible historical value. The shape of the Sassi of Matera contains skill, expertise, aspirations and culture of the people who, day after day, had learned to control adverse and hostile conditions, learning to make living and comfortable a place so inaccessible. The inhabitants of the Sassi of Matera were sure also to transmit from generation to generation, their talent and their knowledge about materials and techniques that made it possible to adapt these artifacts to the more complex needs of its users and the site.

It is today necessary to use local potential, intellectual resources and heritage of knowledge to make harmonious the development by protecting the traditional methods of space management, which can also be used in an innovative way so as to ensure the ecological protection of the site and its sustainable development. It is clear that the evolution of this process is intimately interlaced with the complex dynamics of identity and heritage of the community that there has found a home and took charge of the care and protection of a unique and delicate heritage.

#### **4 THE URBAN NEIGHBOURHOOD: A SMART FORM OF DENSITY THAT CREATES A SMART CITIZENSHIP**

To the “technological” dimension of Smart City you need to add surely the “constitutional” one of the smart citizenship, without which the really idea of Smart City would have no meaning. The intelligence of a city then start from the bottom, by its citizens that in the course of the history, built it and live it in a constant reference between history, current needs and future expectations. Recognize themselves “citizens” of a place certainly start from the concept of identity, and then from the unbreakable link between man and his land, so if on one side is the citizen to build the city, on the other one is the city itself to ensure that citizens recognize themselves as such. In this sense, the biunique relationship emerges between the concept of urbs, understood as the physical form of the city, and that of civitas, described by active and aware set of its citizens; so to talk about smart city, and therefore about smart citizens, not possible disregard the smart physical form of the city that encourages the development of neighbourly relations and, in general, the forms of community life and both material and immaterial sharing.

Looking today at the Sassi of Matera as a possible Smart City is certainly appealing both physically for the enormous potentialities of the place and ideologically because of the bad reputation that the city had over the last two centuries, earning itself the epithet of “national shame” because of the precarious living and hygienic conditions that immediately after the Second World War led to the displacement from the Sassi to the new residential districts that constitute the new city.

For a long time then the Sassi were left to themselves, as a symbol of a condition of degradation and misery now outdated by the citizens of Matera, who are living in modern residential districts with wide tree-lined streets and large squares. It is only in recent years that the topic of the Sassi has become to common interest not only on a purely tourism side but also on the urban one with a slow urbanization of the Sassi district, which today is experimenting the development of the residential activities and also of leisure, catering and hospitality ones. So it is feasible to imagine in the near future an increasing repopulation of the Sassi, which could convert the current image of abandonment in the one of urban vitality where new patterns of living can be developed.

The slow regain of the Sassi by Matera citizens is a process that shows how strong is the bond civitas-urbs and how the scenario of the Sassi is unique in its kind and is not comparable to the new town in terms of beauty and place attraction. In this sense, we should consider the issue of Matera identity and of its citizens that have to reflect itself in a place like the Sassi because they are bearer of cultural traditions, human relationships and therefore the precise historical references and so of the people memory who in this place finds its identity.

In fact, the unique morphology of the Sassi, a landscape with an ambiguous relationship between nature and artifice, emerges as a giant orographic sculpture shaped according to slow processes marked by time through the skilful hand of its citizens. Here, the work of geo-graphy, understood as writing on the ground, takes on a deeper meaning and a significant thickness due to the complexity of the development of the built environment in three dimensions that determines a unique image of biunique relationship between natural landscape and human settlement.

The complexity of the landscape is reflected, in the case of the Sassi, in a considerable density of the built environment which manifests itself in a clear prevalence of the solid on the empty. Then the open space shows itself compact, almost as if it was carved in the built environment similar to a continuous spongy fluid defined by the complex system of connective elements such as roads, staircases and squares, which creates environments for exchange and meeting. The urban space conceived in this way, although compact and apparently confined, configures multiple paths, almost a labyrinth, with respect to which it is not easy to tell where it originates and where it leads, then an unlimited space in a continuous flow. In this sense, it is natural to recall a famous description that in 1925 Walter Benjamin gave of Naples city, defining with the term “porosity” the relationship between space and spontaneous use by its inhabitants.<sup>6</sup> In the Sassi a “porosity” grows in a similar way, concerning the interpenetration between public space and private one, so the urban structure and daily life interfere continually in backyards, streets and staircases.

This socializing relationship between space and urban life, in fact, manifests itself in the Sassi in specific settlement and aggregation ways of multiple units, configuring in the intricate system of connective elements a scenario halfway between the public and private sectors. In this sense, the urban space often configures itself as an extension of the residence in true “urban rooms”, with a closed form by some housing units, defining a particular type of public space, a sign of a conformation of the urban space strongly linked to value of interpersonal relationships.

The structure that constitutes the urban form of the Sassi is largely given by a particular type of settlement: the so-called neighbourhood units, an aggregative form of multi-family units around a common area. The pattern of settlement generally includes about ten homes overlooking small courtyards, all consisting of a single room and without windows, each one containing about ten people. The life of the neighbourhood, for this reason, was carried outside in the common areas, so the social dynamics were in most cases explicated outdoors, figuring the urban space as a theatre of city life where neighbours were actors and public at the same time. It is precisely because of this complexity of using urban and domestic spaces, intricate one in each other, which emerges an intermediate state between public and private sector attributable to the open space in the Sassi, i.e. the collective space, which, although belongs to the public sphere, maintains peculiarities related to the domestic use.

In this way, the urban design, conditioned by the individual morphological conditions, is configured on both the formal scale and on that one of uses in an extremely varied and uncertain definition, generally interpreted through the concept of temporalized space, i.e. that of urban space structured and shaped by the contingent needs of everyday life.

The streets, the alleys and the stairways in the Sassi in fact seem to go beyond their duty to connect the buildings and parts of the city, showing themselves shaped by the gaze of who have lived there before as a meeting and sharing place, hosting today signs of a system of relations extremely clear, set on the labile balance between public and private.

Imagine to live today in the Sassi, inevitably means dealing with the issue of density, understood in its most complete and wide meaning, appearing on both the material and immaterial scale. As you can guess, in fact, an apparent physical density of the built environment accompanies itself in the case of Sassi with a high density of uses, that Michael Sorkin defines “density of meetings”, in his essay “Thoughts on density”, which represents the most important element in the definition of quality of lifestyle, because as the American author writes: “Density is an agent both physical as well as social and environmental. It’s in its most basic definition, which allows the closeness, the meet of bodies in space. This meeting density is the substrate of sociality and the material basis of democracy. [...] A district where you live in a good way is also another style of density, the density of uses. A good district is a place where all the necessities of daily life can be

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<sup>6</sup> Cfr. W. Benjamin, *Immagini di città* (2007).

found within a short distance from home and within easy walking distance. This suggests an idea of completeness, both as a satisfactory density measure and both as unit of measure.”<sup>7</sup>

The socializing and community vocation of these places, then makes it possible to imagine a high quality lifestyle, full of relationships and that encourages the formation of a sense of community, which reconstructs the sense of civitas of the Sassi, lost with the displacement of the postwar period. Specifically, it is possible prefigure contemporary living uses heavily based on the sense of community, close to the most modern forms of Social Housing and Co-housing, that through a social mix and a functional one, would support the vibrancy of the city and a correct social functioning. These modern housing models, if on one hand certainly would ensure services and urban regeneration, characterized by high levels of living, health and safety, on the other one would take advantage of the natural features of the Sassi, in terms of environmental sustainability and energy efficiency.

You can therefore say that the idea of looking today at the Sassi as a potential Smart City starts essentially from its particular dense morphology, that before any other device imposed from the top, would encourage the development of a balanced lifestyle among the most modern housing needs and the traditional social vocation of the historic city made of rich and meaningful human relationships.



Fig. 2: Social life in the “urban neighbourhood”.

## 5 FROM CITY TO DIGITAL PLATFORM: PROJECTS “CLARA” AND “SMART BASILICATA” AND EXPERIMENTATION OF “UNMONASTERY” FOR MATERA 2019

In the era of knowledge and information, which enhances the immaterial aspects of life at the expense of the material ones, cities are called upon to solve old and new problems and to decide their own destiny and future. They are doing this, trying not to succumb to economy that today dominates almost all areas of life, through the development of new “narratives”, made possible by the irruption of digital technologies. These technologies, however, while still providing useful tools to address the difficulties and problems of everyday life, do not always have the ability to fix them permanently. If on the one hand, the urban landscapes are progressively modified by digital culture, on the other hand they foreshadow more and more solutions which exceed the purely technological field to cross over into that of everyday life. Cities thus increasingly

<sup>7</sup> Sorkin M., *Pensieri sulla densità* (2003).

resemble “enabling platforms for connection and expression of the people that live there, for the generation of initiatives and the development of conflicts, for the invention of words and thoughts”.<sup>8</sup> Today the main challenge for contemporary cities is the opportunity to design such platforms with awareness and vision, so that, thanks to operative meeting centers based on co-working, collaborative design and participated decisions, they can become places that facilitate the connection between people and things, favor the rise of innovative initiatives, attract talent and capital, encourage collaborative behavior and build a coexistence aware of the value of sustainability.<sup>9</sup>

The city of Matera, in a meaningful and decisive historical moment for its future, has taken up the challenge by adhering to an important project submitted for the call “Smart Cities and Communities and Social Innovation”, published by the Ministry of Education University and Research (MIUR) in 2012 with the objective to promote, especially in the South of Italy, the use of advanced technologies by citizens, businesses and administrations.<sup>10</sup> Based on the project proposal “Smart Underground Cities”, conceived by the Municipality of Ferrara and aimed at the development of innovative products and services for diagnostic imaging of the subsurface and structures, the final project “CLARA - Cloud platform for Landslide Risk Assessment” has come to second place in the final ranking of the announcement and was funded with EUR 20 million. The proposal forms part within the scope of the “Smart Cities & Communities” in reference to the issue of “Security of the Territory” and is focused on the development of sensors, technologies and innovative systems for non-invasive diagnostics of the subsurface for the purpose of seismic and hydrogeological risk mitigation in urban areas. Research and experimentation, in fact, will concern water management, control and monitoring of networks, techniques for the monitoring of soil and groundwater pollution, conservation and protection of architectural heritage and monuments in areas with high natural risk, preventive archeology, Cloud Computing for Smart Government technologies, innovative systems for control and management of sensors networks and distributed micro-sensors, 3D virtualization and web 2.0 applications. Three are the case studies on which will be tested the use of ground integrated 3D and 4D tomography: the city of Ferrara, interested in drawing up a plan for the seismic risk prevention and the protection of architectural heritage and monuments, the city of Matera, interested in the study of urban underground in the historic center of the Sassi (Unesco World Heritage Site) and the area of the municipality of Enna for the mitigation of landslide risk. The initiative is involved with a mixed public-private partnership, consisting of research centers operating in the country, universities and SMEs and the Municipalities of Matera and Ferrara, and is highly coherent with the most important European initiatives, including Plan-EII “Smart Cities & Communities”, Flagship Initiative EIP-EERA JP on Smart Cities, etc.

Still within the call “Smart Cities and Communities and Social Innovation”, the city of Matera has also been selected as a test area in the field “Smart Culture and Tourism” of the Basilicata Region project “Smart Basilicata”. Co-funded with a public-private intervention amounting to EUR 18.5 million, the project will promote a systemic approach to the region as a “city-region”, including the Val d’Agri, Matera and the metropolitan area of Potenza, according to a model based on the transfer of technology, which will be replicated in other areas of Basilicata, in order to make it “intelligent community” through the use of information and communication technologies and the participatory planning. The inspiring elements of the project were the scientific challenge represented by the definition of new methodologies for the analysis and integration of data acquired by the multi-platform sensors and with different spatial, temporal and spectral resolution (Sensor Synergy), which allows the study of complex environmental processes, and that of the integration of multi-resolution observation systems with technological platforms and ICT architectures (cloud-computing, web-sensors and web-services), which opens up new application scenarios for the provision of innovative services and products to the system of Public Administrations. Founded on the idea of a global Smart City and supported by a partnership of industrial, scientific and local staff, the project aims to identify and develop in the priority areas “Integrated Action for Sustainable Development” (Sustainable

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<sup>8</sup> L. De Biase, Introduction to “Smart Cities. Gestire la complessità urbana nell’era di Internet” (M. Vianello, 2013).

<sup>9</sup> L. De Biase, Smart City ad alta connessione ([www.ilsole24ore.com](http://www.ilsole24ore.com)).

<sup>10</sup> With the “Call for submission of project ideas for Smart Cities and Communities and Social Innovation” MIUR has banned 655.5 million euro (of which 25 projects for Social Innovation presented by young people aged up to 30 years) for action and for the development of Smart cities throughout the country in various fields, including Territorial Safety, Welfare and Inclusion, Technologies, School, Transport and Mobility Earth, Smart Grids, Sustainable Architecture and Materials, Cultural Heritage.



Natural Resources, Renewable energy and Smart Grid, Energy Efficiency and low carbon technologies, smart mobility and last-mile logistics) and “Integrated Action for the Information Society” (Smart cultures and Tourism) innovative technological solutions based on the integration of enabling technologies, including cloud computing platforms for the access and use of data and services, service-oriented architectures (SOA), sensors and advanced networks of microsensors (including the “mesh networking”), the technologies of Earth Observation (EO) and technologies related to the Internet of Things (interfaces NFC, RFID). The interest is focused on the development of prototype applications, differentiated according to the specificities of the different socio-economic-territorial components of the “diffused city of Lucania”, that will help to promote the use of new technologies in the field of Public Administration and the provision of multi-level e-governance services based on an innovative technological platform and consistent with the European priorities.<sup>11</sup>

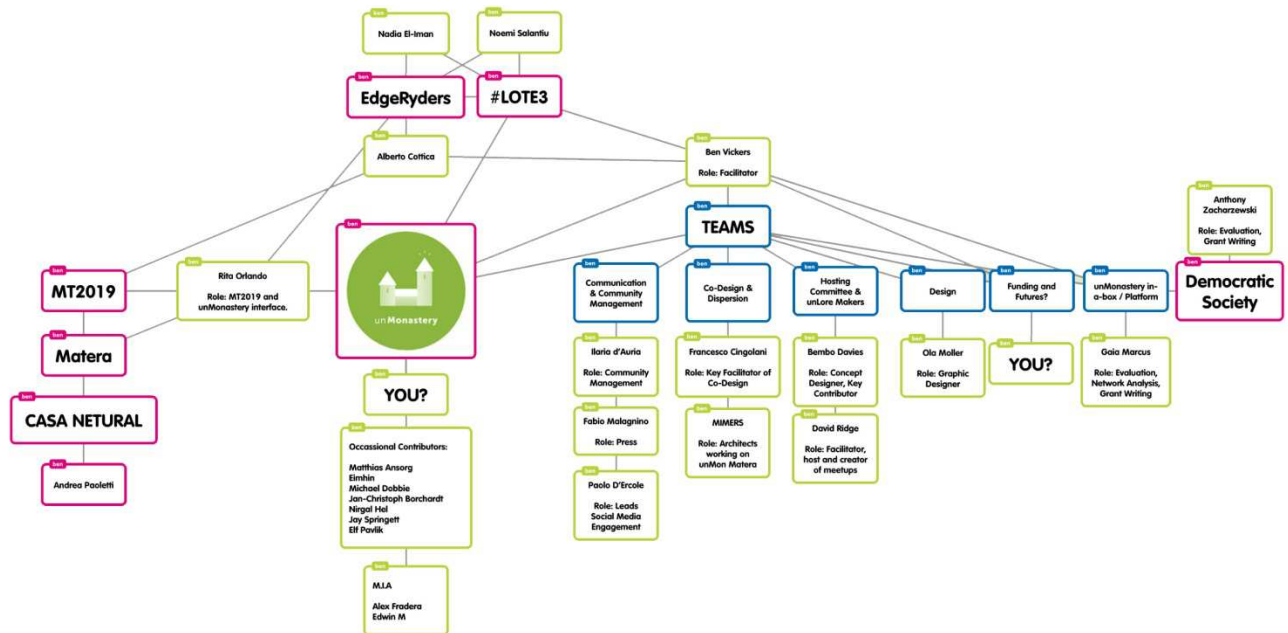


Fig. 3: Experimentation unMonastery. Map of the links between promoter subjects, community and thematic areas.

In parallel to the technical challenge represented by the projects dedicated to the development of new digital platforms, the city of Matera is also leading a major experiment on the social aspects highlighted by the development of such platforms. Since the beginning of 2014, in fact, was formed and established in the Palace “Rione Sassi” the first prototype of “unMonastery” in the world as an area of co-living and co-working at the service of small town and a place of technological and social innovation sustained by co-creation and co-learning processes between the local community and unMonasterians, which is accepting non-monks, or hackers, artists, designers and developers around the world to work on radical innovation.<sup>12</sup> The pilot project is part of the strategy for the candidacy for European Capital of Culture 2019 of the city of Matera (entered in the short-list of the six finalists) and is based on close collaboration with established networks online (through the platforms of the activists Edgeryders<sup>13</sup> and Committee Matera 2019<sup>14</sup>) and a calendar of activities offline made of participatory workshops and residencies. It is an answer to the waste of resources, material and intellectual, and aims to develop a new kind of social space, through a residency program between the Sassi inspired by the social functions of the traditional monastery, in which local communities welcome a group of innovators, bearers of strong skills and a spirit of service to the

<sup>11</sup> M. Salvia (CNR-IMAA), scientific coordinator of “Smart Basilicata”, Il progetto SMART BASILICATA ([www.factor20.it](http://www.factor20.it)).

<sup>12</sup> It is inspired by some rules of monastic life, including but not visible hierarchy, the presence of only men and adherence to one religion, why it is called un-Monastery.

<sup>13</sup> Community born as “spread think tank” of experts citizens to support the Council of Europe for the European youth policy, that at the end of the project in which it was involved decided to continue to exist as an independent organization.

<sup>14</sup> Composed in 2011 by the main institutions of Basilicata to prepare and support the candidacy of Matera 2019, has signed a protocol agreement with Edgeryders LBG for the development of the prototype of the unMonastery.

community, that in exchange for food, accommodation and social recognition are committed to resolve the critical issues of the place. In addition, the project aim to develop deep relationships among unMonasterians and between them and the local community in order to solve a number of priority issues for the city, with the help of everyone who wants to collaborate even not being necessarily a professional in that field. Among the main current initiatives there are “Open Analytics and Financing”, “Radical Transparency”, “Open Street Mapping Challenges”, “Business Plan vs. Sustainability Plan”, “Partnership Open”, “Open Space Initiatives” at the end of which the activities undertaken will be continued independently by local communities or may give impetus to new ideas for a new series of activities. The social impact of the project will be measured using the model “prove and improve” outlined by the New Economics Foundation (NEF)<sup>15</sup> and must be understood in terms of the needs of the community, defining areas of potential impact. The unMonastery will then be able to use a variety of tools and measures, in order to develop and support areas such as welfare, social connectivity, development of skills, enhancement of local social goods and common sense of purpose.

## 6 CONCLUSION

The urban scenarios of contemporary cities are increasingly modified by the impact of the new information technologies.

In the wide horizon of the elements that have contributed so far to define the concept of Smart City, from energy savings and environmental sustainability to digital platforms, is emerging the awareness that technology can not ensure the “smart” daily management of the cities if not integrated with the specificity of places, the needs of the community, the redefining of the life prospects of people who are part of it and the necessity of digital literacy of the masses.

Ecosystem, citizenship and digital platform can therefore be metaphors useful to define a potentially smart city like Matera, but not only that, in which the urban and natural ecosystem preserved intact for thousands of years, the dense structure of the built environment that has naturally generated the social spaces of the “unit of neighbourhood” and the “urban room” and the challenge represented by the possibilities offered by the new digital technologies, are helping to lay the basis for the development of a community technologically advanced, socially aware of its needs and culturally and economically competitive with national and international realities, thanks also to its candidacy for the European Capital of Culture 2019.

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<sup>15</sup> NEF is an English “think tank” promoting social, economic and environmental justice ([www.neweconomics.org](http://www.neweconomics.org)).

