Antonio Leone Carmela Gargiulo
Editors

Environmental and territorial modelling for planning and design

INPUT TeMA*Lab* Dicea UniNa

Federico II Open Access University Press
fedOAPress

Università degli Studi di Napoli Federico II
Scuola Politecnica e delle Scienze di Base

Smart City, Urban Planning for a Sustainable Future

4

Environmental and territorial modelling for planning and design

Antonio Leone Carmela Gargiulo

Federico II Open Access University Press

fedOAPress

Environmental and territorial modelling for planning and design editors Antonio Leone, Carmela Gargiulo - Napoli: FedOAPress. 2018. - (Smart City, Urban Planning for a Sustainable Future. 4).

Web link:
http://www.fedoabooks.unina.it

ISBN: 978-88-6887-048-5
DOI: 10.6093/978-88-6887-048-5

Selection and double blind review under responsibility of Conference Committee

Università degli Studi di Napoli Federico II
Centro di Ateneo per le Biblioteche "Roberto Pettorino"
Piazza Bellini 59-60 - 80138 Napoli, Italy
http://www.fedoapress.unina.it

Published in Italy

Cover and graphic project: TeMA*LAB*

This book collects the papers presented at the 10th International Conference INPUT 2018 which will take place in Viterbo from 5th to 8th September. The Conferences pursues 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 aims to present the state of art of modelling approaches employed in urban and territorial planning in national and international contexts.

This book is the latest scientific contribution of the "Smart City, Urban Planning for a Sustainable Future" Book Series, dedicated to the collection of research e-books, published by FedOAPress - Federico II Open Access University Press. The volume contains the scientific contributions presented at the INPUT 2018 Conference and evaluated with a double peer review process by the Scientific Committee of the Conference. In detail, this publication, including 63 papers grouped in 11 sessions, for a total of 704 pages, has been edited by some members of the Editorial Staff of "TeMA Journal", here listed in alphabetical order:

- Rosaria Battarra;
- Gerardo Carpentieri;
- Federica Gaglione;
- Rosa Anna La Rocca;
- Rosa Morosini;
- Maria Rosa Tremiterra.

The most heartfelt thanks go to these young and more experienced colleagues for the hard work done in these months. A final word of thanks goes to Professor Roberto Delle Donne, Director of the CAB - Center for Libraries "Roberto Pettorino" of the University of Naples Federico II, for his active availability and the constant support also shown in this last publication.

Rocco Papa
Editor of the Smart City, Urban Planning for a Sustainable Future" Book Series
Published by FedOAPress - Federico II Open Access University Press

Table of contents

Session 3 - Rural landscapes and well-being: towards a policy-making perspective

Session 4 - Smart planning

Session 5 - Maintenance, upgrading and innovation in cultural heritage

Session 6 - Urban and environmental planners: who is the client? The planners jobs in a new millennium

Session 7 - Big data and data mining

Session 8 - ICT & models: planning for communities

Special session 3: Geodesign

LANDSCAPE URBANISM'S INTERPRETATIVE MODELS

A NEW VISION FOR THE TIBER RIVER

DONATELLA CIALDEA, CHIARA POMPEI

L.a.co.s.t.a. Laboratory, University of Molise
e-mail: lab.lacosta @unirmol.it
URL https://www.lacosta.unimol.it

How to cite item in APA format:
Cialdea, D. & Pompei, C. (2018). Landscape urbanism' interpretative models: a new vision for the Tiber River. In A. Leone & C. Gargiulo (Eds.), *Environmental and territorial modelling for planning and design*. (pp. 57 - 68). Naples: FedOAPress. ISBN: 978-88-6887-048-5, doi: 10.6093/978-88-6887-048-5

ABSTRACT

Our proposal identifies the River Contract as a process to implement the urban public spaces through the redevelopment of the Tiber River as a natural infrastructure. The River Contract is a participatory process with operational implications for the redevelopment of river basins. The state of art of the River Contract in Italy has been analyzed. Our sample area is located in the Roma Province, along the Tiber River in the area from Fara Sabina to Castel Giubileo. This particular area is actually not covered by any Contract, although there are a lot of naturalistic elements and boundary conditions that could lead to a good success and unexpected implications of this new instrument, oriented not only to naturalistic engineering, but also to urban design. Values of this actually not covered area have been highlighted through some different landscapes urbanism's categories: Waterscapes that include the Tiber River and other tributaries; Naturalscapes that include some Regional Natural Reserves and the "Laghetti in Località Semblera" Natural Monument and finally the Regional Natural Park of Veio; Ruralscapes that involve all rural zones, including areas related to CREA (Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria) and CNR laboratories; Culturalscapes as archaeological areas, castles and ancient buildings, museums and ancient mills; Infrastructuralscapes that involve Salaria, Tiberina, Flaminia, Nomentana Roman Consular Roads and local railways. The aim of our investigation, supported by territorial georeferenced analyses, is the Regeneration Strategy for the Tiber River to connect all these Values, related to different "Scapes" for the new "urban" dimension.

KEYWORDS

Public Space; River Contract; Urban/Territorial Dimension

1 INTRODUCTION

Our dissertation investigates the relationship between the plurality of factors that insist on the river landscape. This approach can still be more significant in a context of Inner Areas, such as geographical areas subject to strong centrifugal forces, with demographic problems and unstable development, but endowed with resources that are lacking with the large centers of agglomeration, with strong attraction potential. Furthermore, Inner Areas can be the basis for the study of polycentric solutions aimed at improving the production quality. In order to optimize the relationship between cities and countryside, they can accept models of development linked to forms of valorization of the natural and cultural heritage and to the maintenance of their territorial identities. The River Contract tool (RC), voluntary negotiated and participatory programming agreement, may be an opportunity for achieving the landscape quality aims foreseen by our National Code for Cultural and Landscape Heritage of 2004, as amended and supplemented (Repubblica Italiana, 2004). River Contracts make the principles of protection of the landscaping plan their own, both under the profile of its naturalistic and environmental relevance, as well as artificial landscape, man's work (Cialdea 2017b; Cialdea & Cacucci, 2017), as it has been described in the National River Contracts Charter of 2010 and defined by the National River Contracts Table (Tavolo Nazionale dei Contratti di Fiume 2010). The River Contract presents itself, in the light of these considerations, as a new opportunity to affect the development potential of Inner Areas. It can become the driving element of a new vitality for these places, as a territorial management tool that starts from the bottom, and therefore from the needs and desires of people who live on the territory (Cialdea & Quercio, 2017; Corrado, 2014; Minervin, 2014). Many national and international studies address the matter of the relationship between planning tools and the river landscape (Bianchini, 2014; Esposito, 2014; Ingaramo & Voghera, 2016) and they are also more and more the subject of specific studies for graduate (Ciuffreda, 2017; Pompei, 2018) and PhD (Morri, 2017) thesis. Therefore, the RC potential lies precisely in its capacity to concretize operations destined to overcome the greatest challenges in the territorial and environmental field. It can become a catalyst to promote the implementation of district planning tools, in favour of better management of water resources and more efficient use of agriculture (Servadei, 2015) and, at the same time, to improve integrated actions related to the vast area planning. In several investigated cases, which are increasingly involving national and international territories, opportunities to promote practical actions for the development of the most disadvantaged territories through this tool are focused (Bastiani, 2011), with policies destined to Inner Areas and also to vulnerable environments as is the case of waterways enclosed in wetlands. Our project is related to the completion of the River Contract network of the Tiber River. The aim is to connect and make efficient the Tiber network from the point of view of the landscape management, from Umbertide to the river mouth, in order to create a "public use" network. To do this, it was elaborated the new proposal of the "Middle-Low Tiber River" Contract, in the stretch that goes from Fara Sabina to Castel Giubileo, in the Lazio Region in a part all included within the Province of Rome. This Inner Area is the only stretch uncovered by the River Contract of the Tiber River and that generates a break and a separation between the "Tevere umbro" (Tiber River along the Umbria Region) and the "Tevere romano" (Tiber River along the Rome area), thus losing the discourse of protection and valorization of river and landscape continuity. The project, in line with the current orientation of the territorial and landscape management, intends to remedy this separation. A reference RC planning model has only existed a few years, thanks to the push, the commitment and the researches carried out by the National River Contracts Table, born specifically in 2007 as working group of the Italian Local Coordination A21, with the objective to create a community able to exchange experiences

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

and promote river contracts in Italy. Because of this, in the legislative field, different laws aid to structure RC themes and process ensuring RCs planning status, from the European level to the regional one (in our case-study the Lazio Region). At European level there are several directives related to the water framework safety. The first one is the Habitats Directive 92/43/EEC, that means "Safeguarding biodiversity through the conservation of natural habitats and wildlife in the European territory of the Member States to which the treaty applies" (European Commission, 1992). Then the Water Framework Directive 2000/60/EC has been elaborated to prevent qualitative and quantitative deterioration, to improve water status and ensure sustainable use, based on the long-term protection of available water resources (European Parliament and Council, 2000). The Flood risk Directive 2007/60/EC references to the identification of flood and risk areas, in accordance with common criteria and for the assessment and management of flood risks (European Parliament and Council, 2007). At the national level, in Italy, we find the already mentioned Legislative Decree No. 42/2004 which defines the principal environmental safeguard measures, as well as the Law No. 14/2006 (Repubblica Italiana, 2006a). In order to attend the European directives, the D. Lgs 152/2006_art. 68bis establishes national reference measure in the field of environmental impact assessment, soil defence and water protection, waste management, reduction of air pollution and compensation for environmental damage (Repubblica Italiana, 2006b). With the same aim, according to the European Flood Risk Directive, the national D. Lgs 49/2010 pursues on the assessment and management of flood risks. In the last few years, after several Italian river flooding, the need of common rules to preside over the river basins lead to define the above mentioned National River Contracts Charter which describes the River Contracts as "a process of negotiated and participatory programming aimed at the containment of eco-landscape degradation and the redevelopment of the territories of basins and hydrographic sub-basins" (Repubblica Italiana, 2010). Furthermore, the Law No. 221 (Repubblica Italiana, 2015) identifies RCs as "voluntary instruments of strategic planning and negotiation that pursue the protection, the correct management of water resources and the valorization of the river territories, together with the safeguard from the hydraulic risk, contributing to the local development of these areas, which contribute to the definition and implementation of district planning tools at the basin and watershed level" (art.43bis). Finally, thanks to the basic quality definitions and requirements of the River Contracts (Tavolo Nazionale dei Contratti di fiume, 2015), the RCs has been defined as a support of the planning and/or action. At regional level the Resolution No. 42 (Regione Lazio, 2007) and the Resolution No. 787 (Regione Lazio, 2014) pursue the maintenance of the integrity of the water resource, compatibly with the uses of the resource itself and the socio-economic activities of Lazio people. They contain necessary measures for the qualitative and quantitative protection of river basins, in addition to the interventions aimed at ensuring the achievement and maintenance of the water system. Analyzing the current laws, River Contracts are intended, firstly, to help overcome the logic of the emergency to create, whereas, a synergy between urban, rural and natural context, integrating tangible and intangible actions for culture, quality of life, landscape and economy. The primary objective is to define environments related to water courses as 'living landscapes' (Jønch-Clausen & Fugl, 2001), so that they can be perceived and governed as such also into the urban dimension.

2 THE TERRITORIAL CONTEST

Our study area, of about 400 km^2, runs for 23 Km from Fara Sabina to Castel Giubileo, but the analyzed river section is long about 40 Km. It includes 10 municipalities in the Province of Rome. The most important element is the Tiber River, which is perceived only as a negative element, because of its floods at the expense of urban living. In this regard, the little town of Monterotondo turns out to be the most affected,

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

presenting many critical issues. The proposal of the Middle-Low Tiber RC takes start, as for other cases in Italy, from the need of hydraulic safety. In this particular case, there is the need to restore relations that existed in the past (former brick kilns) and to bring the river back to its role of public space and "Itinerary of water and communication" (Provincia di Roma, 2010), now completely lost, but living in remembrance. A role that crosses and continues the relationship "history, culture and nature". The elements most in view, such as the agricultural areas along the irrigated valley of the Tiber, are the predominant character of the area and they have an important role for the production, care and use of landscape, for the traditional social structures maintenance, as well as for a multifunctional basis for other economic sectors (Cialdea, 2000, 2012, 2017a, 2018; Cialdea & Badami, 2017; Cialdea & Maccarone, 2012; Cialdea & Mastronardi, 2014a and 2014b, 2017a and 2017b; Cialdea et al., 2006; Ducci et al., 2017; Pindozzi et al., 2016).

Then there are the industrial areas that are located close to the Tiber, its valley and the highway (Riano, Fiano Romano, Capena, Monterotondo, Montelibretti villages) and several protected areas. Other elements that are not valued are the research institutes of CREA and CNR and the recreation areas-Tiber Extreme Park, Salaria Sport Village, Lago La Barcaccia, CONI-Riano Sport Centre - which would instead bring the decisive impetus to safeguard the environment and the health of populations, favouring its careful utilization, but also to create the possibility to recover old paths, that can be restored as greenways to slow mobility and historical buildings along them can be used by a sustainable tourism (Cialdea, 2018; Cialdea & Cacucci, 2017). The project is based on the valorization of all these values and this new network will be related to the other Tiber RCs stretches (Fig. 1) and recreational areas in terms of relapses on the urban environment:

- the section from Umbertide- Città di Castello is covered by the Alta Umbria RC (2008) and it is characterized by some attractive elements: the Corbara Lake and the Alviano Lake, 500 hectares of humid environment that is a naturalistic oasis. This final stretch of the Tiber River in the Umbria Region, of about 50 km, constitutes the Tiber River Park. Several interventions and bike tracks were made in safety of the embankments (Umbertide);
- the stretch from Città di Castello to Orte is characterized by the increase of the flow, after the confluence with the tributary Chiascio, the one with the Paglia River and especially after the confluence with the Nera River. Here we find the Paglia RC (2013), which at the height of Orvieto has allowed the creation of a river urban park and the Nera RC (2010), which aims to the valorization of the natural and historical environment;
- the section Orte-Fara Sabina is covered by the Medium Valley Tiber RC (2012). Here the Tiber River receives the abundant waters of the Nera-Velino watercourses and borders Tuscia and Sabina, where the Treja, Amella first and the Farfa then flow in, alternating with ravines and sheltered areas. There is the "Fiasco" that you can admire from the alluvial terraces. Here we find the Treja Valley Regional Park and The Nazzano Natural Regional Reserve;
- the stretch from Castel Giubileo to the Tiber mouth is covered by the proposal of the Tiber RC in the urban area of Rome (2017). In this area there are strong interaction between urban and natural textures. In addition, the river area is included as one of the strategic programming areas of the Rome Urban Master Plan. Tiber River receives the Aniene River for which the RC (2018) has been proposed.

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

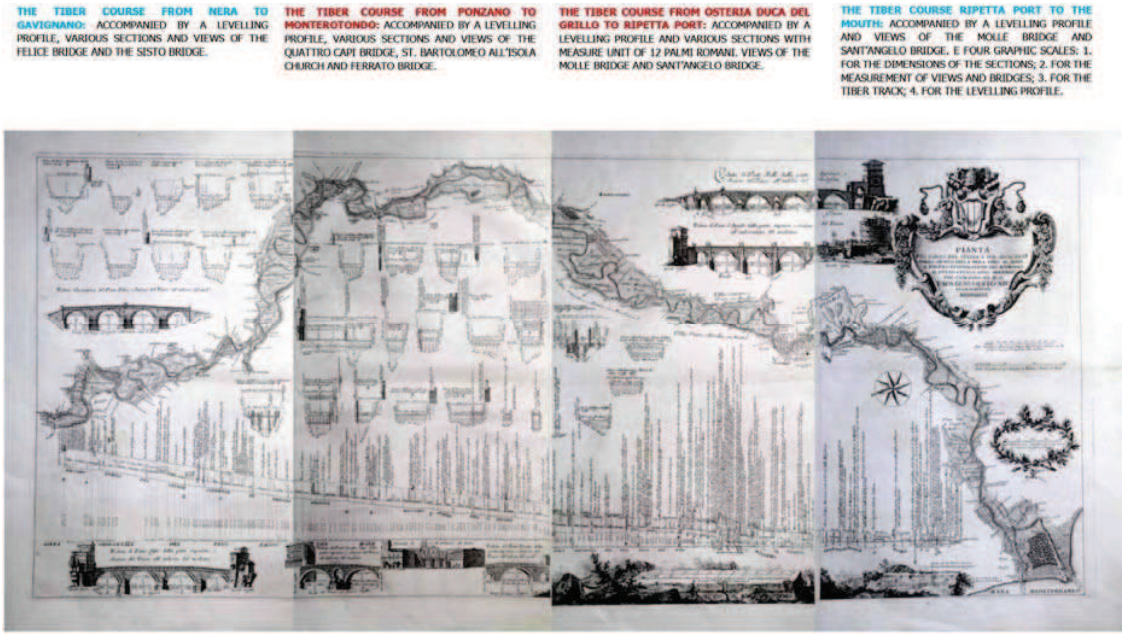

Fig. 1 The stretches of the Tiber River from Nera tributary to the mouth (Source: Pianta del corso del Fiume Tevere, e sue adiacenze, dall'influenza del Nera fino al mare e profilo di livellazione il tutto fatto l'anno MDCCXLIV per comando di N.S. Papa Benedetto XIV felicemente regnante. Chiesa A., Gambarini B., Nolli C., Piranesi G.B. Roma, 1744)

3 THE INTERPRETATIVE PROCESS MODEL

In order to create and develop a reference model (Fig. 2) and to define a project that fits perfectly in the RCs puzzle in continuity of analytical and design logic, able to enhance all the values identified, our proposal has highlighted common tools, characteristics and peculiarities, actions and results of Tiber RCs.

All the already implemented Tiber RCs have in common the training modalities of the process itself: which starts from the identification of the intervention area. Then there is the strategic agenda with the maps of actors, values, interests, projects, tools and resources. Then the process establishes aims and actions of the multidisciplinary relationships with actors. Everything is always discussed, spotted and shared on an active participation and dialogue of institutions, associations and citizens. The innovative feature of these processes is the choice to go in the direction of the horizontal subsidiarity because of the multi-sector, inter-scalar and multi-actor strategies that generate development, trying to take the environment and landscape as the basis on which to rebuild the quality of territory. Thus, the differentiation of territorial systems requires a system of flexible governance, capable of composing conflicts and interests at local level through negotiation processes, adhering to territorial vocations and able to make system by communicating the different programming tools of socio-economic interventions with those of territorial planning.

4 APPLICATION THE CASE STUDY AND RESULTS

Our project has been oriented to relate the cognitive analyses of the territorial context and the RCs common procedures, elaborating the maps of Values, Interests, Resources and Actors. The maps of Values, Interests and Resources (Fig. 3) have been articulated in the logic of the landscape urbanism networks, for which is always more evident that the new urban question is stronger and stronger related to the environmental safeguard and the re-signification of environmental elements for the urban project and its new urban

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

habitability to recycle the city through the water, the soil, the energy, blue and green networks (Gasparrini, 2015).

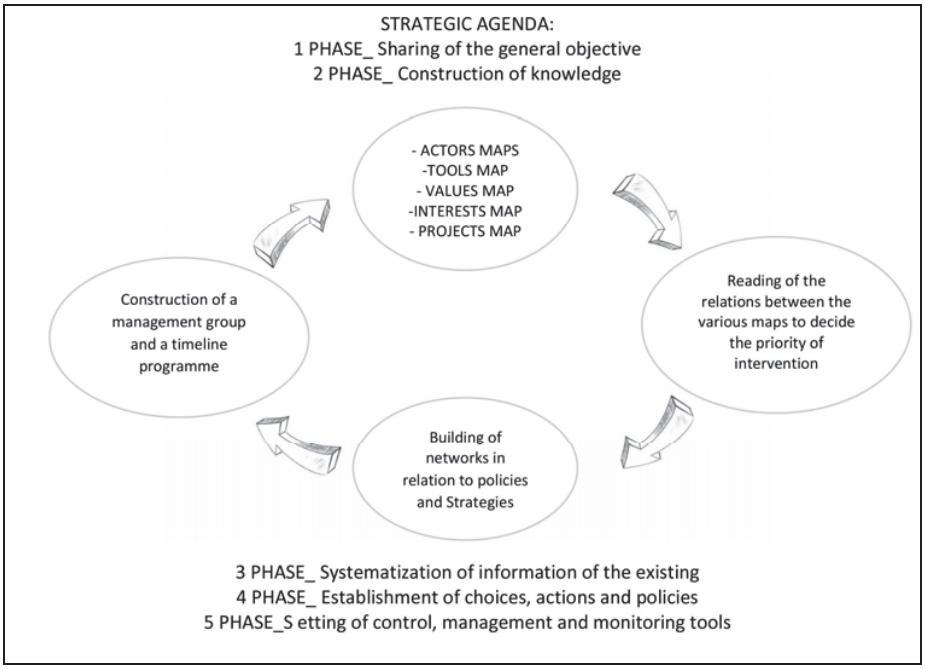

Fig. 2 The phases for the River Contracts development (Source: our elaboration, 2017)

They are:

- *the Water Network.* It provides the securing of the banks and embankments- especially in the section of Monterotondo Scalo-and the construction of docks for small boats, bridges connecting the two banks, works of re-naturalization, nature trails along the embankment. Moreover, it is hypothesized to restore the navigability of the Tiber River for this stretch, at least with small boats for the connection between the "Nazzano Tevere-Farfa" Regional Natural Reserve and the "Laghetti" Natural Monument in Monterotondo;
- *the Protected Areas Network.* It includes the connection through pedestrian and naturalistic paths of the various reserves of the area, as the "Macchia di Gattaceca e Macchia del Barco" Regional Natural Reserve, the "Marcigliana" Regional Natural Reserve, the "Nomentum" Regional Natural Reserve, the "Laghetti" Natural Monument, the "Nazzano Tevere-Farf"a Regional Natural Reserve and the "Veio" Regional Park;
- *the Strategic Areas Network.* All the research centres of CREA and CNR Laboratories and the industrial areas present in the territory are located. An internal connection to these centres is envisaged, almost to create a diffuse scientific park, as well as foresees the Provincial Plan of Rome in this area;
- *the Culture and Recreation Areas Network.* This one intends to relate historical and architectural buildings creating a territorial museum network (Museums of Riano, Fiano Romano, Monterotondo, Mentana, Montelibretti), through integrated pedestrian pathways to public and private transport. Moreover, it provides the connection of the territorial sport centres of Riano, of Monterotondo and of Castel Giubileo;

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

- *the Waste Areas Network.* The study area is characterized by disused and abandoned areas and former quarries. particularly the Monterotondo Scalo former brick kilns and the Riano quarries. These constitute a strong degradation element, but at the same time a great opportunity for retraining, thanks to their historical testimony- within the urban or in the midst of protected environmental systems;
- *the Agricultural Areas Network*. In the area, there are three predominant landscapes. The irrigated countryside landscape that is located in the Tiber Valley. The urbanized countryside landscape that is grafted in the municipal territory of Monterotondo, Mentana and Fontenuova and it presents a strong interaction between agrarian and urban matrix. This is a peculiarity of the place to be protected and valued. Then there is the rolling hills landscape which encloses ploughed fields, olive groves, orchards in large or medium sized meshes;
- *the Infrastructure Network*. In this case, it is necessary to strengthen the railway line, the stations and the consular routes. The railway assumes a very important character: being a public transport, it allows to relate quickly the various points of interest in a direct way with the possibility to be integrated with the public motor-transport.

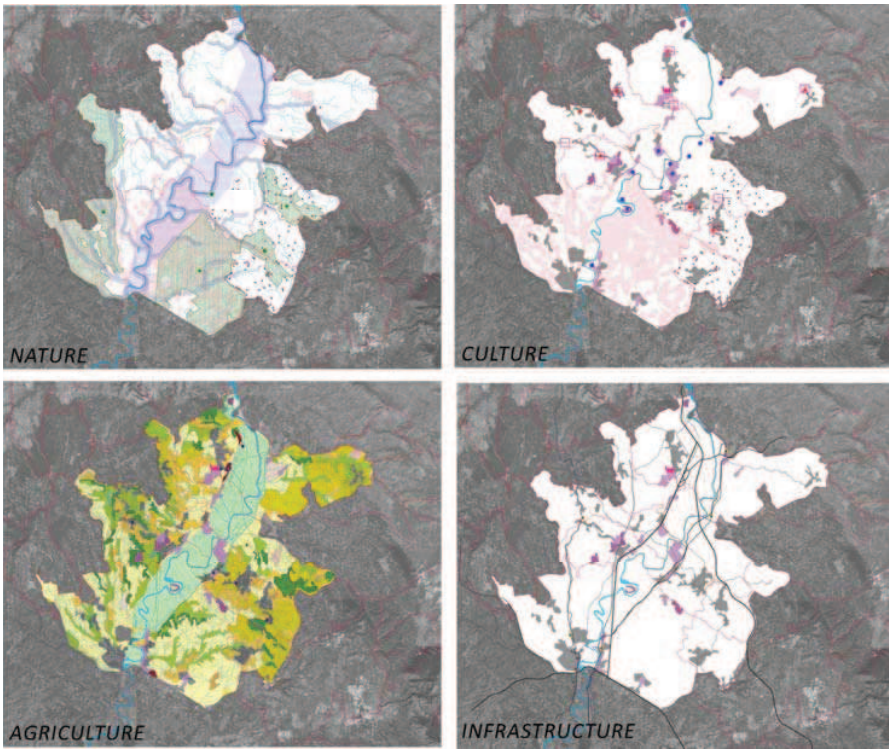

Fig. 3 The Nature, Culture, Agriculture and Infrastructure Categories (Source: our elaboration, 2017)

Thus, it had been possible to elaborate a map which represents the Masterplan of the Middle-Low Tiber River Contract (Fig. 4), where there are also our proposals for strategic local actions or suggestions for the projects to apply. The Actors' Map has been drawn up as a list of potentially involved subjects, to be questioned about their interest in the RC's implementation. They are the municipalities of Monterotondo, Fara Sabina, Riano, Fiano Romano, Castelnuovo di Porto, Montelibretti, Capena, Mentana, Fontenuova, III-

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

IV Municipi di Roma, the Tiber River Basin Authority, the Institute for Technologies Applied to Cultural Heritage (ITABC), MiBACT, the Archaeological Trust of Lazio and Southern Etruria, The Regional Natural Reserve of the Macchia di Gattaceca and Macchia del Barco, the Regional Natural Reserve of Marcigliana and the RomaNatura Regional Association, the Regional Natural Reserve of Nomentum, the Regional Natural Park of Veio, the Sabina by bike Association, the Tiber Extreme Park, the Monterotondo cultural associations, the Archeoclub d'italia-section Mentana-Monterotondo. The Tools and Resources' Map establishes the RCs guidelines to be integrated with intervention programmes for local-scale projects. Consequently, the resources must be considered from time to time in relation to the local scale implication of public, private and entrepreneurial or community subjects.

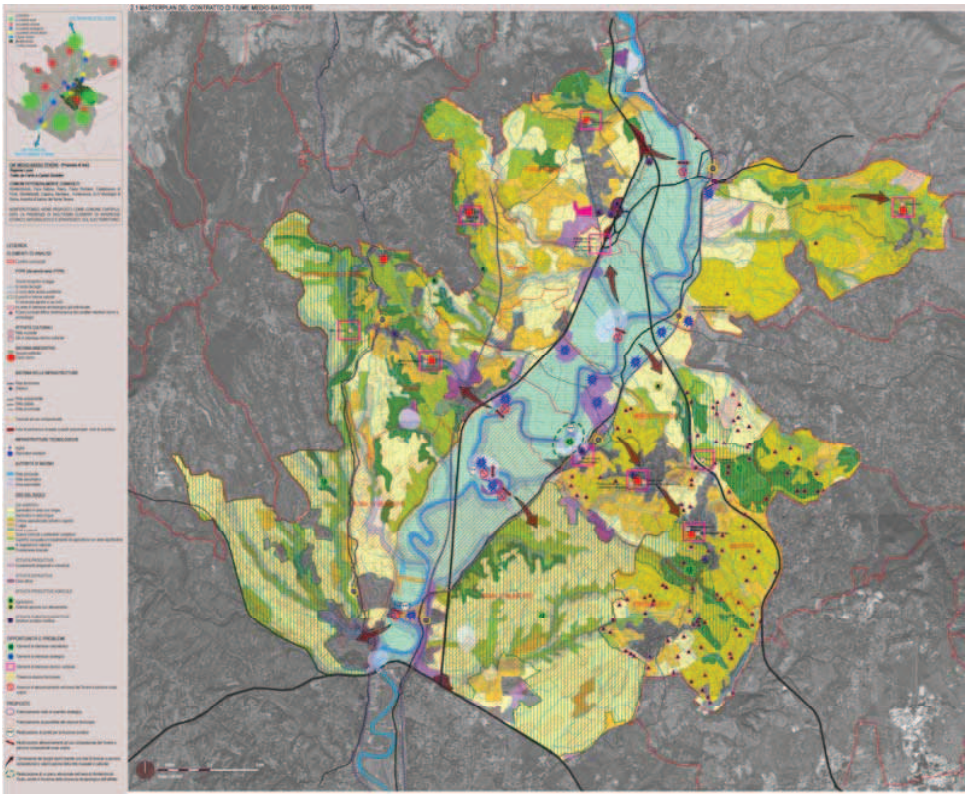

Fig. 4 The Masterplan of the proposed Middle-Low Tiber River Contract (Source: our elaboration, 2017)

5 CONCLUDING REMARKS

The strategy is to connect all the identified territorial values through the Tiber infrastructure, the Via Salaria and the railway. The Middle-Low Tiber River Contract assumes the dimension of Landscape Contract and that finds in each municipality its most complete and complex realization, that is the form of "urban" dimension. Actually, our proposal has defined the systematization of territorial data of values and interests (Tab. 1) elaborated through the territorial analyses. The data have been articulated by three macro-areas: Category, Network and Element, from the general group to the single point. Each one includes a classification of the environment through different level, according to the Italian legislative planning levels and the landscape set of features.

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

CATEGORY	NETWORK	ELEMENT
NATURE	Water network	Tiber River
		Tributaries
	Protected areas network	Macchia di Gattaceca and Macchia del Barco Regional Natural Reserve
		Marcigliana Regional Natural Reserve
		Nomentum Regional Natural Reserve
		Laghetti in località Semblera Natural Monument
		Veio Regional Park
		Valle del Treja Regional Park
		Nazzano Tevere/Farfa Regional Natural Reserve
HISTORY AND CULTURE	Culture network	Locus Feroniae archaeological area
		Eretum archaeological area
		Monterotondo old town
		Mentana old town
		Fiano Romano old town
		Montelibretti old town
		Riano old town
		Monterotondo historical museum
		Monterotondo multimedial museum
		Mentana Garibaldian museum
		Montelibretti museum
		Ancient via Francigena
		Mills and farmhouses
		Castelli e palazzi storici
	Strategic areas network	CNR Monterotondo Institute
		CNR Montelibretti Institute
		Riano civil protection
		Montelibretti Fireman school
		CREA Monterotondo Institute
		Railway station
		Monterotondo Industrial area
		Capena Industrial area
	Recreation areas network	Extreme Tevere Park
		Barcaccia lake
		CONI Riano
		Salaria Sport Village
	Waste areas network	Monterotondo ex brick kilns
		Santa Colomba ex brik kilns
		Ficarone ex brick kilns
		Riano quarries
		Riano abandoned area
AGRICULTURE AND RURAL	Irrigated countryside landscape	Tiber valley
	Rolling hills landscape	Monterotondo area
		Roma-Fonte Nuova area
	Urbanized countyside landscape	Monterotondo countryside
		Mentana countryside
		Fonte Nuova countryside
		Montelibretti countryside
INFRASTRUCTURE	Railway network	Fiumicino Orte (FR1)
		Roma-Viterbo
	Road network	Consular road Salaria
		Consular road Nomentana
		Consular road Tiberina
		Consular road Flaminia
		A1
	Pedestrian network	Monterotondo
		Riano

Tab. 1 Systematization of the territorial data, by categories, networks and elements. (Source: our elaboration, 2017)

They are the basis for the realization of an evaluation system so to understand and identify the priorities of intervention. These are in development and they have as evaluation criterion a cross-reading of the interests of the stakeholders involved for each element.

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

The same evaluation can be further articulated, establishing for each element the possible scenarios, according to the existing regulations or the proposals made by the stakeholders themselves: each stakeholder can express his own degree of interest for each scenario. Finally, merging data we could define the optimal scenario.

This process can also be done by simulation in laboratory, with the role play, but it is obvious that it lends itself much better to the application in reality. It represents a full aid for the systematization of the data in the "Partecipatory Perspective" of the River Contracts. So, at the time it was built a cognitive framework both of the criticalities and the environmental and landscape-territorial values, and of the local policies founding the strategies of intervention.

The completion of the project requires to activate a working table with the participation of the involved actors to accomplish the next steps of the medium-term strategic scenarios definition, the evaluation protocol processing, the integrated management and action programmes proposal and the training, communication and education plans application.

REFERENCES

Bastiani, M. (Ed.). (2011). *Contratti di Fiume. Pianificazione strategica e partecipata dei bacini idrografici*. Palermo, Italy: Dario Flaccovio Editore.

Bianchini, A. (2014). *Il contributo della Convenzione delle Alpi alla cooperazione internazionale inmateria di acqua e alla diffusione dei Contratti di Fiume*. Paper presented at the 9th Tavolo Nazionale dei Contratti di Fiume, Venice, Italy.

Cialdea, D. (2000). Le zone marginali e il recupero attraverso le coltivazioni biologiche. In D. Cialdea (Ed.), *Le tematiche del territorio rurale: confronto con le esperienze degli U.S./Rural Land Issues. A Comparison with the American Experience. Quaderno n. 7* (pp. 201-210). Campobasso: Arti Grafiche La Regione.

Cialdea, D. (2012). A new landscape planning approach in areas with a strongly rural matrix. In M. Campagna, A. De Montis, F. Isola, S. Lai, C. Pira and C. Zoppi (Eds.), *Planning Support Tools: Policy Analysis, Implementation and Evaluation* (pp. 453-464). Milano, IT: Franco Angeli.

Cialdea, D. (2017a). Il contratto di fiume: un'opportunità per i nuovi piani paesaggistici. In AA.VV., *Atti della XIX Conferenza Nazionale SIU. Cambiamenti. Responsabilità e strumenti per l'urbanistica al servizio del paese* (pp. 64-73). Milan-Rome, IT: Planum Publisher.

Cialdea, D. (2017b). Sustainable Actions For Urban And Territorial Regeneration. *International Journal of Design & Nature and Ecodynamics*, *12*(3), 271-280. doi: https://doi.org/10.2495/DNE-V12-N3-271-280

Cialdea, D. (2018). Smart Land: Regeneration and Sustainability in Lost Scenarios and New Performances. In R. Papa, R. Fistola and C. Gargiulo (Eds.), *Smart Planning: Sustainability and Mobility in the Age of Change* (pp. 15-36). Springer International Publishing. doi: https://doi.org/10.1007/978-3-319-77682-8

Cialdea D, et al (2006). Agricultural Values. In: CIALDEA D.. Interreg Reports. Materials For Adriatic Cross Border Project Report N. 2 Land Use Evaluation. Analysis in the Different Landscape Performances Progetto GES.S.TER. / Interreg IIIA. CAMPOBASSO:Arti Grafiche La Regione, vol. 2, p. 88-101.

Cialdea, D., & Badami, A.A. (2017). Rigenerare la città multiscalare: trasformare i processi, innovare gli strumenti. In AA.VV., *Atti della XIX Conferenza Nazionale SIU. CAMBIAMENTI. Responsabilità e strumenti per l'urbanistica al servizio del paese. Catania, 16-18 giugno 2016* (pp. 261-267). Milan and Rome, IT: Planum Publisher.

Cialdea, D., & Cacucci, S. (2017). The River's Contract: an opportunity for the new Landscape Planning Activities. *International Journal of Design & Nature and Ecodynamics*, *12*, 314-323.

Cialdea, D., Maccarone, A. (2012). Territorial diachronic maps for the Regional Landscape Plan. In M. Campagna, A. De Montis, F. Isola, S. Lai, C. Pira and C. Zoppi (Eds.), *Planning Support Tools: Policy Analysis, Implementation and Evaluation* (pp. 386-398). Milano, IT: Franco Angeli.

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

Cialdea, D., & Mastronardi, L. (2014). A Multi-Criteria Methodology Oriented to the Preservation of the Coastal Areas Landscape. *Mathematics and Computers in Science and Engineering Series*, *35*, 237-243.

Cialdea, D., & Mastronardi, L. (2014b). Marginality Phenomena and New Uses on the Agricultural Land. Diachronic and Spatial Analyses of the Molise Coastal Area. *TeMA. Journal of Land Use, Mobility and Environment*, Special Issue INPUT 2014, 235-245. doi: http://dx.doi.org/10.6092/1970-9870/2519

Cialdea, D., & Mastronardi, L. (2017a). Spatial Analysis Methodology for the Italian Coastal Landscape. *International Journal of Energy And Environment*, *11*, 24-37.

Cialdea, D., & Mastronardi, L. (2017b). Spatial Analysis Methodology for the Italian Coastal Landscape: Features and Dynamics Evolution. *International Journal of Mathematical Models and Methods in Applied Sciences*, *11*, 61-74.

Cialdea, D., & Quercio, N. (2017). Natural spaces river land in the urban context area. In A. Gospodini (Ed.), *Proceedings of the Intenational Conference on Changing Cities III: International Conference on Changing Cities III: Spatial, Design, Landscape & Socio-Economic dimensions* (pp. 62-78). Thessaloniki, GRC: Grafima Publications.

Ciuffreda, V. (2017). *Contratto di fiume dei bacini idrici Alento-Foro e rigenerazione urbanistica*. (Unpublished master's thesis). Università degli Studi "G. d'Annunzio", Chieti- Pescara, Italy.

Corrado, F. (2014), Nuove forme dell'abitare nelle terre alte e produzione di territorio. In AA.VV., *Atti della XVII Conferenza Nazionale SIU. L'urbanistica italiana nel mondo* (pp. 941–946). Milan-Rome, IT: Planum Publisher.

Ducci, D., Albanese, S., Boccia, L., Celentano, E., Cervelli, E., Corniello, A., ... & Lima, A. (2017). An Integrated Approach for the Environmental Characterization of a Wide Potentially Contaminated Area in Southern Italy. *International journal of environmental research and public health*, *14*(7), 693. doi: https://doi.org/10.3390/ijerph14070693

Esposito, F. (2014). Ingegneria&Paesaggio in Liguria. Una proposta per una possibile integrazione. In AA.VV., *Atti della XVII Conferenza Nazionale SIU. L'urbanistica italiana nel mondo* (pp. 962–969). Milan-Rome, IT: Planum Publisher.

European Commission (1992). *Council Directive of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (92/43/EEC)*. OJ No. L 206/7 July 7 1992.

European Parliament and Council (2000). *Directive of 23 October 2000 establishing a framework for Community action in the field of water policy* (2000/60/EC). OJ No. L 327/1 December 22 200.

European Parliament and Council (2007). *Directive of the of 23 october 2007 on the assessment and management of flood risks (2007/60/EC)*. OJ No. L 288/27 November 6 2007.

Gasparrini, C. (2015). *In the city on the cities*. Trento, IT: LISt Lab.

Ingaramo, R., & Voghera, A. (Eds.). (2017). *Topics and Methods for Urban and Landscape Design: From the river to the project*. Cham, CH: Springer International Publishing.

Jønch-Clausen, T., & Fugl, J. (2001). Firming up the conceptual basis of integrated water resources management. *International Journal of Water Resources Development*, *17*(4), 501-510.

Minervin, R. (2014). *Il Contratto di Fiume Paglia quale asse portante di una Strategia Progettuale per le "Aree Interne"*. Paper presented at the 9th Tavolo Nazionale dei Contratti di Fiume, Venice, Italy.

Morri, E. (2017). *Lo stato ambientale del bacino del fiume Foglia: Funzionalità Fluviale e Servizi Ecosistemici* (Doctoral dissertation, Universita' degli Studi di Urbino "Carlo Bo", Urbino, Italy). Retrieved from http://www.riservaripabianca.it/doc/Studi/TESI_PHD_MORRI_ELISA_Uniurb.pdf

Pindozzi, S., Cervelli, E., Capolupo, A., Okello, C., & Boccia, L. (2016). Using historical maps to analyze two hundred years of land cover changes: case study of Sorrento peninsula (south Italy). *Cartography and Geographic Information Science*, *43*(3), 250-265. doi: https://doi.org/10.1080/15230406.2015.1072736

Pompei, C. (2018). *Infrastrutture naturali e artificiali nell'area di Monterotondo Scalo: paesaggi di vita. Una strategia per lo spazio* (Unpublished master's thesis). Università La Sapienza, Rome, Italy.

Provincia di Roma (2010). *Piano Territoriale Provinciale Generale Testo approvato dal Consiglio Provinciale con Delibera No. 1 del 18/01/2010 (Province of Roma Territorial Plan approved by the Provincial Council by Resolution No. 1 of 18/01/2010)* [inItalian].

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5

Regione Lazio (2014). *Deliberazione Giunta Regionale del 18 novembre 2014 No. 787. Adesione alla Carta Nazionale dei Contratti di Fiume (Resolution of the Regional Council 18 November 2014 No. 787. Accession to the National Charter of River Contracts)*. BURL No. 95 S. 2 (2014) [inItalian].

Regione Lazio (2007). *Deliberazione del Consiglio Regionale del 27 settembre 2007 No. 42. Piano di Tutela delle Acque Regionali (PTAR) ai sensi del D.Lgs. n. 152/99 e successive modifiche ed integrazioni (Resolution of the Regional Council 27 September 2007 No. 42. Regional Waters Protection Plan (PTAR) pursuant to Legislative Decree No. 152/99 modified and integrated by successive)*. BURL No. 34 S. 3 (2007) [inItalian].

Repubblica Italiana (2004). *Decreto legislativo del 24 gennaio 2004 No. 42 Codice dei beni culturali e del paesaggio e successive modifiche e integrazioni (Legislative Decree approved on January, 24th 2004 No. 42, modified and integrated by successive, National Code for Cultural and Landscape Heritage)*. Gazzetta Ufficiale 45 SO n. 28 (2004) [inItalian].

Repubblica Italiana (2006a). *Legge del 9 gennaio 2006 No. 14. Ratifica ed esecuzione della Convenzione europea sul paesaggio, fatta a Firenze il 20 ottobre 2000. (Law approved on January, 9 2006 No. 14. Ratificatione and Implementation of the European Landscape Convention, made in Florence on 20 July 2000)*. Gazzetta Ufficiale 16 SO n. 16 (2006) [inItalian].

Repubblica Italiana (2006b). *Decreto Legislativo del 3 aprile 2006 No. 152, Norme in materia ambientale. (Legislative Decree approved on Avril, 3 2006 No. 152 Environmental Regulations)*. Gazzetta Ufficiale 88 SO n. 96 (2006) [inItalian].

Repubblica Italiana (2010). *Decreto Legislativo del 23 febbraio 2010 No. 49. Attuazione della direttiva 2007/60/CE relativa alla valutazione e alla gestione dei rischi di alluvioni e successive modifiche e integrazioni (Legislative Decree approved on February, 23 2010 No. 49, modified and integrated by successive, Implementation of the European Directive 2007/60/EC on the assessment and management of flood risk. Gazzetta Ufficiale 77 (2010)* [inItalian].

Repubblica Italiana (2015). *Disegno di Legge C. 2093 approvato definitivamente con Legge del 28 dicembre 2015 No. 221, Disposizioni in materia ambientale per promuovere misure di green economy e per il contenimento dell'uso eccessivo di risorse naturali (Draft Law C. 2093 definitively approved by Law dated 28 December 2015 No. 221, Environmental provisions to promote green economy measures and to contain excessive use of natural resources)*. Gazzetta Ufficiale 13 (2016) [inItalian].

Servadei, L. (2015). *I contratti di fiume nella programmazione dello sviluppo rurale 2014-2020. Opportunità per lo sviluppo delle aree rurali e delle aree interne. Misure agro-climatico-ambientali e paesaggio*. Paper presented at the 10th Tavolo Nazionale dei Contratti di Fiume, Milano, Italy.

Tavolo Nazionale dei Contratti di fiume (2010). *Carta Nazionale dei Contratti di fiume*. Retrieved from https://nuke.a21fiume.eu

Tavolo Nazionale dei Contratti di fiume (2015). *Definizioni e requisiti qualitativi di base dei Contratti di Fiume, 12 marzo 2015, Tavolo Nazionale Contratti di Fiume, Gruppo di Lavoro 1: Riconoscimento dei CdF a scala nazionale e regionale e definizione di criteri di qualità*. Retrieved from https://nuke.a21fiume.eu

AUTHOR'S PROFILE

Donatella Cialdea is a full Professor (Urban Planning) at the University of Molise since 1988. She is the Director of the Laboratory L.A.Co.S.T.A. (Laboratory for activities relating to the Territorial Development and Environment) at the University of Molise in order to prepare students and operators in the Geographical Information Systems field). Already Dean of the Faculty of Engineering from 2009 to 2012 and the Coordinator of the PhD Course in "Landscape Analysis and Valorisation" at the University of Molise, based consortium with the University of Sassari, from the cycle XX. She was the Scientific Coordinator of the International Master Level I Pro.D.U.C.T.I.V.E. Coast (Proposal for the Development of Urban and Coastal Territory in relation to the Value of the Environment), aimed at the technical-scientific training of a specific professional figure - the Selective Interpreter of Territorial Data).

Chiara Pompei, graduated in architecture with thesis in Urban Planning with the theme "Natural and artificial infrastructures in the area of Monterotondo Scalo: Landscapes of life. A strategy for public space". She deals with issues related to urban regeneration and the integration of planning tools at different territorial, local and urban levels. She received a special mention for the contribution "River Tevere and Monterotondo: A strategy for the public space", presented at the fifth edition of the National Prize of River Contracts, conferred by the Alta Scuola and the National Table of River Contracts in Rome. She participated at the International Workshop of urban Planning and Architecture "Mending Termini Station" in collaboration between University of Rome Sapienza, University of Roma Tre, Universidad Nacional de Rosario, Universidade Federal do Rio Grande do Sul, Universitat Politècnica de Catalunya in Rome, in order to draw up proposals for the rethinking of Termini station as public urban space.

ISBN:978-88-6887-048-5
DOI:10.6093/978-88-6887-048-5