Smart Land: Regeneration and Sustainability in Lost Scenarios and New Performances

Donatella Cialdea

Abstract Urban Regeneration should have a role of integration between Planning and Design activities; moreover, it very often looks like a single project with detailed proposals and performances, without a general vision of the area. It is therefore necessary to build a reference for the design choices, which primarily concern the city but increasingly involve the surrounding territory. This paper explores the relationship between the plurality of factors that exist on the settlements and productive activities assets. Our work aims to deal with every aspect of the Regeneration potential, which is an opportunity for enrichment of urban planning, especially in the cases of the Regions—as Molise is—in which really cities do not exist but there is a "continuum" between adjoining Municipalities in a mainly rural territory.

1 Introduction

This study concerns the relationship between sustainability and landscape in connection with the urban and territorial regeneration. It focuses on natural infrastructures, which together with the artificial infrastructures, define the land asset, and moreover they define landscape features of the territory on which urban planning is implemented. It is a large-scale project for the New Landscape Plan for the Molise Region, in the South of Italy, as an experimental model of application of the recent Italian Code for Cultural and Landscape Heritage (Decreto Legislativo 42/2004), belonging the European Landscape Convention (CoE 2000, 2008). In fact, it exhibits a part of the work carried out for the Molise Region, under the Agreement by the Region with the "L.a.co.s.t.a. Laboratory" of the University of Molise, directed by the writer (Regione Molise 2011). Specific analyses, which are presented in this paper, aim of promoting a better environmental, social and economic sustainability in the planning of the hydrographical district, especially for the unique regional river that is the

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Biferno River. A vast debate is actually in progress about the contemporary design of territorial transformation scenarios around the river's stream, involving the enhancement of the landscape and local development. The case analyzed, in fact, concerns the main stream of the Molise region.

This course was analyzed in relationship between natural resources and infrastructures: the water course is the connector element and generator of landscape performances and it is linked to the productive activities of the surrounding territory, or better, of the "territories" it passes through.

Rivers are generally at the heart of internal areas in the relationship with the tradition of productive activities such as elements resilience of the landscape (Regione Molise 2015; SNAI 2014); in their surroundings it is possible to describe new approaches for the regeneration of the territories involved in these waterways (Ingaramo and Voghera 2016).

Rivers establish relationship with the city and landscape and they are able to create a more or less extended area of influence. So, in our study, we identify some relevant topics useful to design these areas, which are important in the research on the landscape in order to identify the transformation's quality.

Moreover in these areas we could approach the analyses of lost scenario and new performance. How do you can re-think the relationship between settlements and their surroundings, remembering that everything is inserted in its environment that has its own life? We aimed to underline the Landscape Heritage transformation: how much you can keep the ancient form, already itself layered, allowing the new buildings realization, that inevitably will create a new plot? Territories sometimes seems not be able to receive new entries and sometimes instead soft turns, creating new contexts. In the variety of different perspectives, through which you can analyze the relationship between man and environment, the landscape occupies a specific space, because of the importance that it can assumes in determining the environmental quality.

Landscape means all signs that characterize a territory, also the memory of its past and present functions. So a lot of factors will be kept into account. No word has ever been wider than the word landscape, so much so that it can be affirmed that "in the landscape you can enter from different doors" (Socco 1999): it is a good that can be considered and analyzed according to different points of view and with different purposes. But in reality the term includes everything that surrounds us: from the built to the natural environment, from what is clear evidence of the past to what is recently realized. It is not important to depth single disciplines that suggest or encode mode of action (assuming specific historical era or particular geographical area). Much more interesting is to recognize that an individual perception feel exists, and above all there are questions that each operator of transformations arises when designs or achieves a design for it, especially when these projects become an integral part of the landscape.

Ultimately, the landscape no longer only applies for protection but it is expected to be exploited, fulfilling the dictates of the reform of Title V of the Italian Constitution that has distinguished the protection activity from that of enhancement: "we protect and preserve the cultural asset so that it can be offered to collective knowledge and enjoyment". Regions and Local Authorities are therefore called to organize

activities aimed at creating an "integrated system" for the enhancement of the "good". Certainly, in organizing the provisions concerning the protection and enhancement of landscape assets, the National Code inevitably takes into account the European Landscape Convention and, defining the criteria for activities that can affect the landscape, it also focused the forecast of its sustainable development. "Through it the ability to minimize impacts and ensure the design quality of the works and interventions that must be carried out in areas of particular value" (Cialdea 2010).

Fundamental role is played, certainly, by the planning tool. However, for our study, the will to grasp the spirit of the engineering design of the transformations on the territory is a fundamental aim. Our project concerns Natural Infrastructural, also related to environmental risk. In our sample area, the Biferno River in Molise represents the main territorial invariant of the central area of the region, with the Matese mountain chain from which it was born. In our studies for the New Landscape Plan of the Molise Region, the Biferno River was the basic element for identifying the different homogeneous territorial areas for the entire province of Campobasso. The first area is that of the source of the river, a flat agricultural territory with numerous environmental emergencies and characterized by the presence of numerous quality agro-fed farms; the central part of the Biferno course is characterized, then, by a hilly territory with great geological-environmental difficulties and the last area is the flat area of the Lower Molise characterized by intensive agricultural production and, in the part of the river mouth, by the presence of the Industrial core of Termoli. In this context our methodology was experimented, in the implementation phase of the landscape planning, in a different way in the different contexts of the river basin to achieve the quality objectives set by the National Code, highlighting the peculiarities of the places, in correlation with the real needs of the territories and needs of the inhabitants.

The case study is particularly significant because it summarizes in itself morphological characteristics typical of internal areas but at the same time highly exploitable environmental potentialities. Therefore, it is important to respect the possibilities of environmental recovery, but also with a view to "territorial" rebalancing, aimed at local development of a territory, which as traditionally continues to have strong agricultural connotations (Cialdea 2009; Cialdea and Mastronardi 2014; Corrado 2014; Esposito 2014).

2 Landscapes in Evolution and Neutral Spaces

Territory is not just a neutral container of anything, but it is a space for urban and landscape design: actions on the territory could create new performances with new opportunities. Moreover, it could not be considered as a neutral space in which transformation actions take place, but every intervention create new interactions with complex dynamic changes, involving the landscape system (Albrechts 2003; Crosta 2010; Healey 2003; Kunzmann 2007).

All this condition becomes even more complex when the territory, as it is largely the case on the Italian territory, is subject to strong phenomena of instability. The chosen example denotes precisely such a limit situation.

In these cases, in fact, there is a multiplicity of factors: an interdisciplinary approach is clearly necessary, in order to create operational categories for territorial analysis, that are able to interpret the transformations of the landscape, historical and contemporary.

Moreover, dynamics of urban planning evolutions will be explored, because actual plans, often obsolete, are not able to create certain strategies. In the specific case of the region in question, then, the level of the vast area planning tools is absolutely missing. In Molise, in fact, the plans of the over-municipal level have never been drafted: at present there is only a preliminary study by means of territorial matrices for the province of Campobasso (Provincia di Campobasso 2007) and nothing for the other province of the region, which is Isernia. The revision of the current landscape plans, drawn up under the Galasso Law (Legge 431/1985), was carried out by our L.a.co.s.t.a. Laboratory: then we focalised our attention on these "difficult areas" analyzing transformations of the territory in relation to existing urban and regional planning tools. The Molise region is characterized by the low density, with many small towns and no cities: only Campobasso, the regional capital, Isernia, the capital of the second province and Termoli, located in the small strip overlooking the sea, have connotation of small cities. The area under study in this paper concerns a municipality in the first ring of the municipalities around Campobasso, in a part crossed by the river Biferno, the heart of our study, and by one of the few significant road infrastructures of the region, or the Fondovalle del Biferno, called "Bifernina". The region is therefore characterized by a prevalent agricultural activity, the permanence of which, however, has not succeeded in preventing the proliferation of spaces without a particular connotation, undecided, intermediate spaces, between built and not built. It is precisely on these spaces that our attention is focused, because they can be those on which it is possible to experiment new processes of landscape transformation, capable of generating processes of territorial regeneration (Musco 2009; Coyle 2011; Tejedor Bielsa 2013; Jakob 2013). Our methodological approach aimed at defining territories that will become:

(a) spaces for productive activities involvement respect therefore to the production factor of the watercourse. The work was done on two fronts: the first concerning the current situation of activities related to water and in particular with regard to agricultural productivity and the second through an overview linked to the possibilities of creating "specific productive";
(b) spaces for inhabitants involvement, carried out on two fronts, to the local inhabitants and to the tourist flows;
(c) spaces for the involvement of privileged places from a naturalistic point of view, assuming to create a connection network between them.

For the new organization of the territory in those risk areas, in order to promote territorial planning actions, a multiplicity of factors was analyzed. In summary, the territorial project must involve a complex dimension, which however change its

features in a dynamic matter and implicate both the natural heritage and its fruition, obviously linked to its involvement. The river's basin is formed by different systems (infrastructural, urbanized and environmental) related each other and located in the landscape asset which is continuously in transformation: In fact, there are many elements that come into play, intertwined on the one hand to the institutional reform process underway in our country and on the other to the already mentioned Internal Areas Strategy, whose development assumes still blurred and variable contours for the different territories involved (De Nigris and Cartolano 2015). Moreover, it is specifically useful to underline the relationship with the landscape quality aims, in order to highlight the necessary link with the landscape planning activities, extending the perspective of the smart city to the vast area. It is important also to analyze the actual debate in Italy on the Law No. 56/2014, which primarily reorganizes responsibilities of Local Authorities, especially for provinces, but also it promotes cooperation between municipalities small in size. Moreover, more recently in Italy a new law was enacted (Law No. 158/2017): it specifies measures to support and enhance small municipalities, with special feature, especially related to hydro-geological instability. In this case it provides the maintenance of the territory with priority to the protection of the environment. In this way, it is possible to understand the territorial project as a territorial development project based on its position and condition, as a transcalar, multidisciplinary project, linked to a sustainable development method (Giaccaria et al. 2013).

2.1 Spaces of Mediation Between Built and not Built in the Sample Area

As regards to the territory involved in the river course, it is inevitable to consider the whole territory that surrounds it: the banks of the river are the areas where it is possible to identify the major land use transformations. Moreover they are also those in which there are the greatest difficulties from the point of view of the stability of the territory. Furthermore, these places have the greatest capacity for resilience. They are, then, characterized by not high population densities, but they offer particular landscapes, in which liveability can be increased. The natural function of the river is in fact important in relation to its intrinsic quality as "creator of liveable landscapes". The river is included in agriculture and forest areas, which involve the collective maintenance of the territory: the focus is, however, in its central role in the management of open spaces, which should be able to restore the relationships between urban and rural systems.

In order to reorganize the New Landscape Plan of the Molise Region, our project aimed to enhance the territorial and landscape identity: for this goal, we analyzed the territorial land and then we defined ten regional districts. For each of them, features and territorial structures were defined. This analysis, in fact, was fundamentally necessary for organizing the data collection and, in subsequent phases, for using

these collected information in the context of the landscape evidence, that gradually were focused.

Now, our attention was concentrated on the central Molise, in consideration of the fact that this area is not currently covered by any landscape plans.

Moreover, Fig. 1 shows the two areas which involve the Biferno River in the central part of its course: they are the two areas of the right and the left banks.

The following sheets describe these districts (Cialdea 2014). The first one was defined as the «Biferno-Trigno Area»: it is characterized by the presence of numerous small towns, with the exception of the urban settlement of Trivento, which is the largest municipality in this area. From a production point of view, the central-northern area emerges, consisting essentially of Trivento and Montefalcone del Sannio, which together with Roccavivara make up more than 60% of the population. In the whole area the problems of soil instability are particularly emerging, which are also responsible for the demographic decline and which are also linked to the landslide to which most of the historic centers are subject. Most of the municipalities of the area, in fact, present noteworthy situations of collapse. Significant naturalistic emergencies concern both the woods and the elements of the "Morge". The territory is basically defined by a grid consisting of parallel courses of the Trigno and the Biferno rivers, between which is located the ridge that separates the two valleys. From the hydrographical point of view the presence of two different basins is found: one part falls in the Trigno basin, while the remaining part is located in the Biferno basin. The signs of the green pathways, the Ateleta-Biferno more to the north, the Celano-Foggia, which in particular crosses the Municipality of Trivento, giving rise to new territorial connotations and finally the Pescasseroli-Candela are still legible. The morphologies of the inhabited centers are inserted in this shirt, which are however characterized by the Slavic origin of many of them.

The second one is the «Biferno-Molise Centrale Area»: it is centred around the city of Campobasso, located in a central position in the region. It enjoys a system of road infrastructures higher than the average situation because it is crossed by the high-speed road «Fondovalle Biferno» and a ring around Campobasso which is connected to this artery under Montagano. The Community is rich in significant cultural heritage. In this area the valley landscape is predominant with the almost constant valley bottom amplitude, which becomes wider near Petrella and then opens towards the area characterized by a minor anthropization, where the inhabited centers located on spurs are located. The south-eastern part of the territory, which also coincides with the border of the province of Campobasso, has its own eastern limit marked by the river Fortore with the artificial basin of the Occhito Lake. The territory of this area is strongly characterized by the green pathways, named «tratturi», articulated around the city of Campobasso, with the prevalent signs of the Celano-Foggia path and the Lucera-Castel di Sangro path. The area laps the chain of the Matese and substantially is a flat "heart" surrounded by mountains and enclosed by the waterways of Biferno and Fortore. The Rocca di Oratino is situated in a privileged position on a rocky spur and allows the control of the Biferno River.

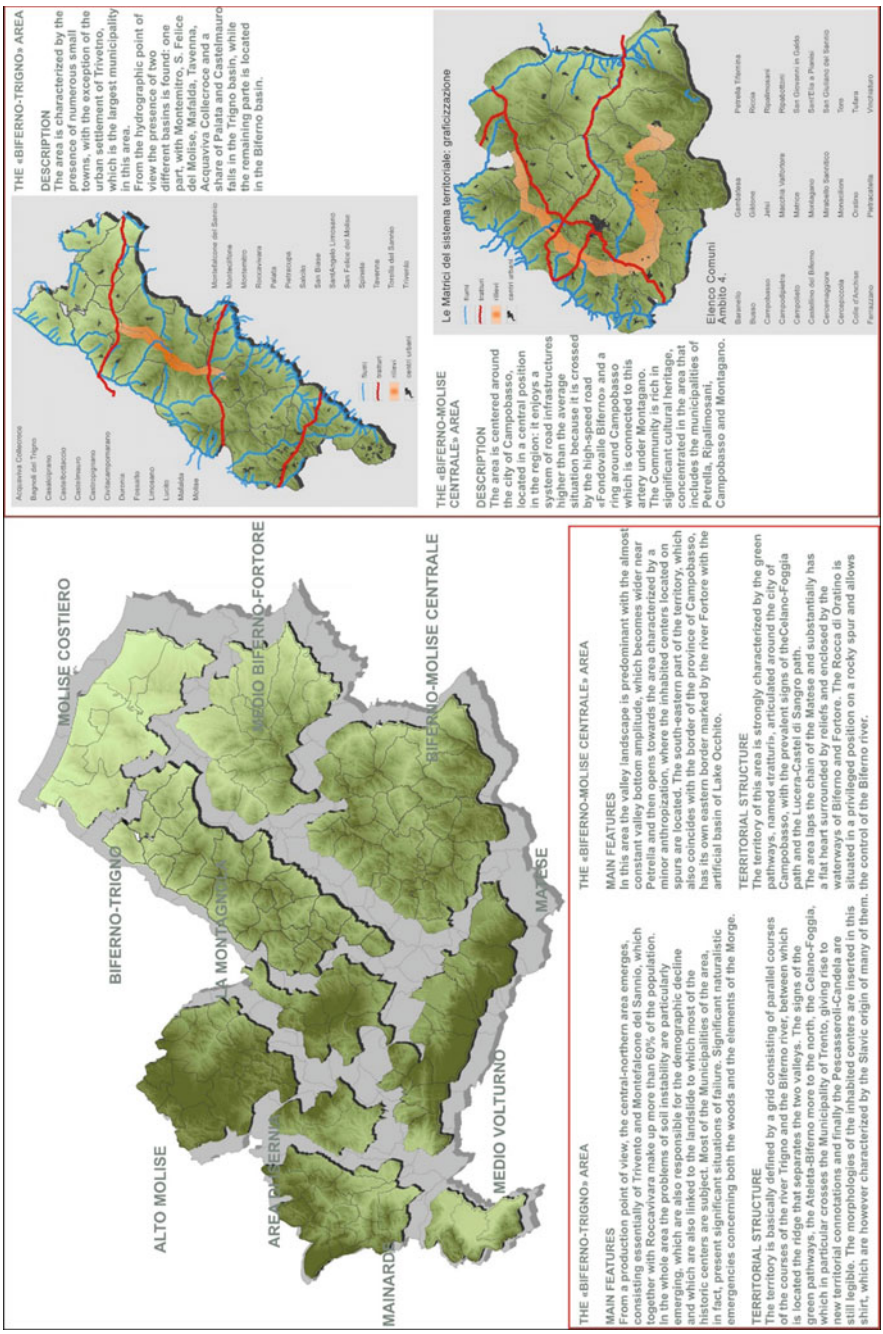


Fig. 1 The two banks of the river: diversity/limits. *Source* lab.lacosta elaboration 2015

3 Living Landscapes: Boundaries and Limits

Our methodology, oriented to define the global condition of different districts of the Molise region, is based on competitiveness and attractiveness of the places linked to the water element as vital landscapes to going towards a quality transformation. In particular for the course of the Biferno River, we defined a specific project, that is the "Biferno Laboratory" project. It is aimed at defining the environmental conditions related to actual and possible uses for environmental and sustainable tourism, renewable energies and multifunctional agriculture.

The project had a first part in which we realized the Geographical Information System, through three indicators sets: the *knowledge* set; the *production* set; the *fruition* set (including public space; sweet mobility; itineraries), as shown in Fig. 2.

This is the first part of our experimentation, which describes the territorial analysis aimed at defining the permanence and fragility of the territory under examination.

The second part of the experimentation is related to the verification of the values and detractors: territorial data, collected in the first stage, according to the five Resource Systems, were analyzed. The five resource systems are: the Physical-Environmental S., the Landscape-Visual S., the Historical-Cultural S., the Agricultural-Productive S. and the Demographic-Tourism S. In some cases the data was extrapolated from maps and they were used as shape files with polygons characterised by attributes that are easily transformable into grids; in other cases the data were in numeric form and diffusion algorithms have been elaborated for each case; in yet other cases the data was provided by the local administration (and for each case desegregations algorithms have been found for the creation of grids containing information useful for research purposes) (Cialdea 2014, 2017).

The data collection process has constantly been carried out in a dual perspective, both for the use of the database and for the data management in a mapping system. By way of example, here are the data for the Biferno area, which falls within the central area of its course, where the phenomena of landslide occurred again. Diversities will emerge on both sides of the Biferno. Basically in this picture there are some pre-imagination of scenarios.

There is therefore a confirmation of the difference in regional planning between the two shores, also from the urban point of view. In fact, on the right Biferno side, there is the regional capital of Campobasso with the ten small villages which surround it, as identified by the Master Plan of Campobasso (Beguinot 2000; Cialdea 2012). On the other side of the river, urban settlements are less consistent and they are located in a vast area oriented to agricultural activities. As well as analysed for the preparation of the Landscape Plan, it is necessary now to compare our scenarios, oriented to the landscape quality, with the current planning tools of municipalities involved in our sample area.

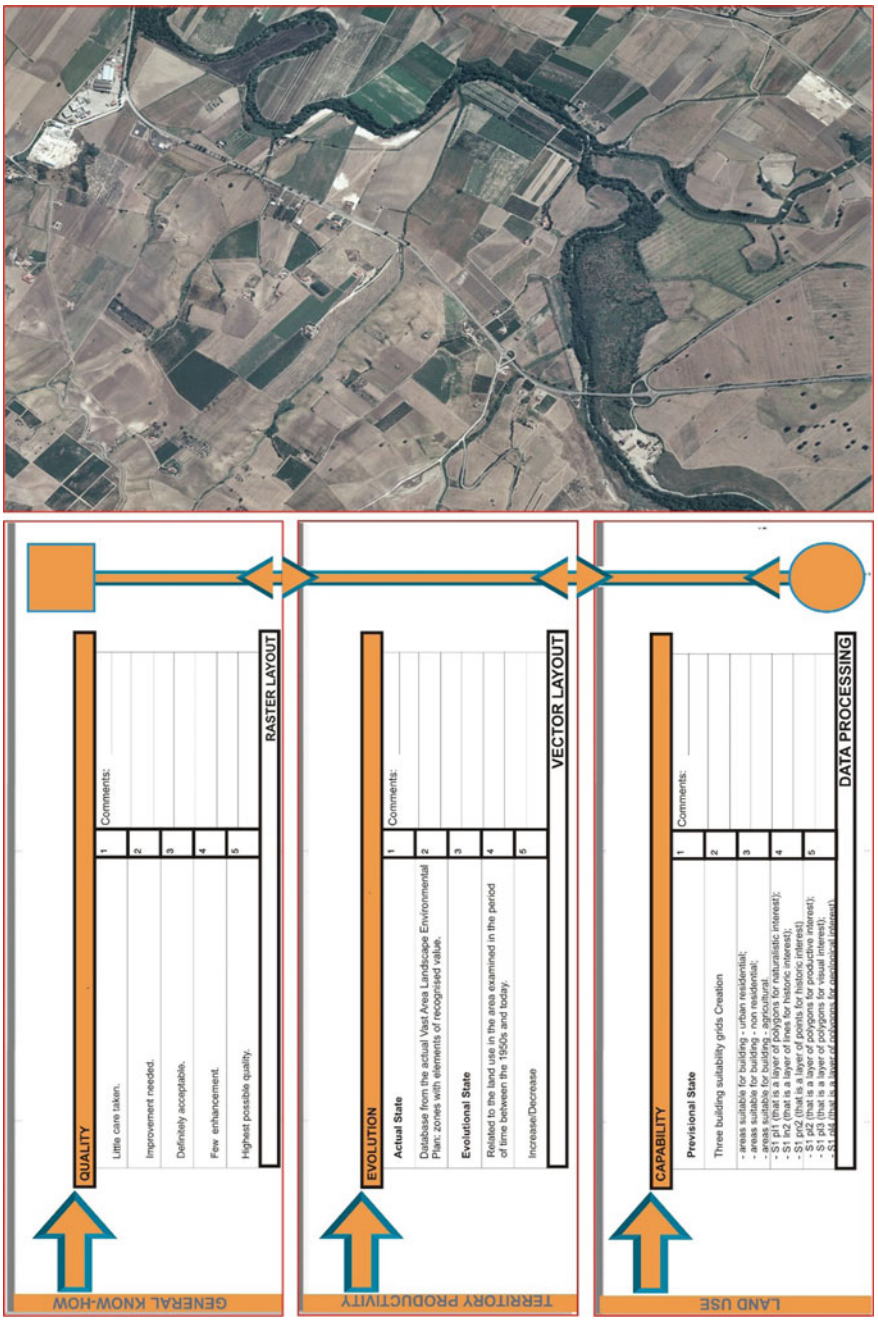


Fig. 2 The Biferno project: liveability/sustainability. *Source* lab.lacosta elaboration 2016

3.1 The Relationship with Local Planning Tools

The territorial area of the Biferno River includes, certainly, an over-municipalities district: moreover, the area under examination in this study falls within the municipality of Ripalimosani, that is one of the ten small towns around Campobasso. Therefore, we analyzed its local planning tools.

It is also necessary to remind, as already mentioned, that for the over-municipal level there is no reference: the territorial coordination plan has never been drawn up, except for a work carried out, which basically consists of an analysis of the matrices of the region.

In particular this plan highlights the socio-economic matrix (with population density and variation, territorial and social indicators), the environmental matrix (with natural and anthropic risks, correct use of resources and integration of landscape and environmental values), the historical-cultural matrix (with architectural, archaeological and historical emergencies), the Settlements matrix (with historical centers, urban systems, industrial areas and various facilities), the productive matrix (with agriculture, industries, tourism activities and other services), the infrastructural matrix (with road and railway networks and technological and energy infrastructures).

The principal aim of the Province Master Plan is the development of the Ripalimosani municipality, based on valorisation and networking of local resources. This approach leads to the definition of territorial areas, corresponding to geographical contexts whose historical-cultural, social and territorial characteristics can favour the creation of a network of relationships and concerted policies, able to bring a significant added value to the development programs. Moreover, the provincial territorial planning confers to the vegetation and woodland system priority purposes of naturalistic protection, of hydro-geological protection, of climatic and tourist-recreational function, besides productive and of scientific research. Therefore forms of utilization that may significantly alter the balance of existing wild species must be prevented, also pursuing the objective of restoring the forest heritage as a multifunctional forest ecosystem (Provincia di Campobasso 2007).

As far as the plan of the Municipality concerns, the General Modification of the Master Plan (dated 1992) is in approval (Ripalimosani 1992, 2008, 2011, 2012, 2017).

Firstly the attention is centred on the geological instability: the hydro-geological plan (adopted by resolution of the Institutional Technical Committee No. 87 of 28 October 2005, and approved by the Technical Committee No. 25 of December 16, 2004 and implemented by the Basin Authority, pursuant to Law 183/89) aims to guarantee to the territory, affected by the river basin, adequate levels of safety with respect to the hydraulic and hydrogeological phenomena. This plan consists of two sections: hydraulic alignment and slope alignment.

The Basin of the Biferno River has a draining basin surface of 1316.1 km^2. From the lake to the mouth of the river, the valley is characterized by the presence of irrigation crops with industrial destination such as sunflowers, orchards and vegetables.

Along the banks are various plant species; the most frequent are willows, poplars and robinias.

In the municipal territory there was a gypsum quarry in the "Gessiero area". This quarry was discontinued in the early 1960s. There is a curiosity about some gypsum outcrops that donate selenite samples rather impure and mostly non-transparent moreover: it is possible to find beautiful specimens of sericolite. In those areas there is an old quarry, visible from the "Bifernina Road", from which up about 50 years ago raw material was extracted for a small industry that produced plaster for construction. The gypsum quarry that has been inactive for a long time, in Ripalimosani.

In addition, the territory of Ripalimosani is affected by the presence of the following Site of Community Importance belonging to the Nature 2000 network. It is the Site code "SCI IT7222247", named "Biferno Valley from Quirino flow confluence to the Guardalfiera Lake-Rio flow" (Chlora Criteria 2015).

Furthermore, there is a part of the municipality's surface affected by the landscape constraint, declared as public interest area by the Ministerial decree dated 01/08/1977. This is a tool provided for the protection of areas of greatest landscape value, with the aim of mitigating the inclusion of buildings and infrastructures in the landscape, in order to make activities compatible with the environmental context. This restriction was introduced by the law 1497/39, integrated with the law 431/85, subsequently inserted into the Consolidated Law on the legislative provisions regarding cultural and environmental heritage Legislative Decree no. 490 of 29/10/1999, and finally confirmed by the Legislative Decree n. 42 of 22/01/2004.

Because of these reasons, in this municipality Master Plan, in relation to the described phenomena of geological and hydrogeological instability, some areas subject to the risk of flooding along the Biferno river have already been reclassified from "Zone D" (industrial area) and "Zone T" (equipped for tourism and leisure), to "Zone E3" (for controlled reforestation and/or respect of existing crops).

In addition, other actions can be pointed out:

- the complete enhancement of the existing and sometimes abandoned naturalistic and landscape, monumental and residential heritage, susceptible of a tourist attraction and of stimulating flows;
- the best use of existing plants and the development of new infrastructures suitable to correspond to the tourist vocation;
- the enhancement and qualification of events linked to existing local traditions and the planning of new cultural (theatrical and musical), recreational, sporting and cultural initiatives;
- the strengthening of relations with the emigrant associations;
- the recovery of the green pathways and of the sites linked to transhumance.

The idea of development of Ripalimosani derives and depends on being located at the border of the Campobasso territory to which it is strictly connected. There is the necessity to respond adequately to the dynamics of the neighbouring urban centre and at the same time it is necessary to enhance and preserve the landscape-environmental quality. The identified actions aim to consider the landscape as an

indicator of territorial and urban quality, also through the rehabilitation of the rural building heritage with historical-testimonial value (Ripalimosani 2017).

4 Sustainability Versus Resources Utilization: The Project's Results

The "Biferno Laboratory" is related to the creation of a shared scenario for the development of the territory, describing the conditions for further strategic planning. This experience offered a training path that moves from the real knowledge of the environmental, cultural, architectural context in which it operates to the urban and landscape-environmental planning.

The analysis phase, as a fundamental moment of the planning process, lays the basis for correct and coherent actions on the territory and guarantees the creation of the critical and informative apparatus, especially in view of the identification of a unitary and shared development strategy for the Biferno river internal area.

Elaboration of project ideas and implementation of concrete examples of territorial action methods, will be intended as suggestion for new purposes on the territory, based on environmental and sustainable tourism, multifunctional agriculture and renewable energy.

With this logic, it is possible to extend the concept of smart city to the territory, with the aim of creating a smart and inclusive sustainable territory, above all oriented towards an intelligent fruition. The search for the quality of the landscape becomes, in this way, an indispensable factor for development, starting from measures to contain the exploitation of natural resources, adding value to the territory and above all linked to the intrinsic characteristics of the territory, with differentiations in its different parts.

The project's results reveal some critical issues, which should be added to those already described, deriving from official planning tools. Within the municipality of Ripalimosani some elements were found, from the comparative reading of the elements considered as values in connection with the elements considered as detractors. In conclusion, they can be summarized as follows:

1. among the environmental features, in addition to the extremely important geological criticality, the relevance of the difference between the two shores, which then consolidates the choice of two separate areas for the purposes of landscape planning;
2. the proposal for a photovoltaic system among the new insertions of energy infrastructures;
3. new purposes for productive activities.

In relation to the first factor, undoubtedly the predominant problem is the landslide phenomena. In fact, beyond the area identified in this work as a case study, another area with similar problems of failure falls again in the municipality in question. The landslide event, which had a paroxysmal evolution in 1998, severely damaged

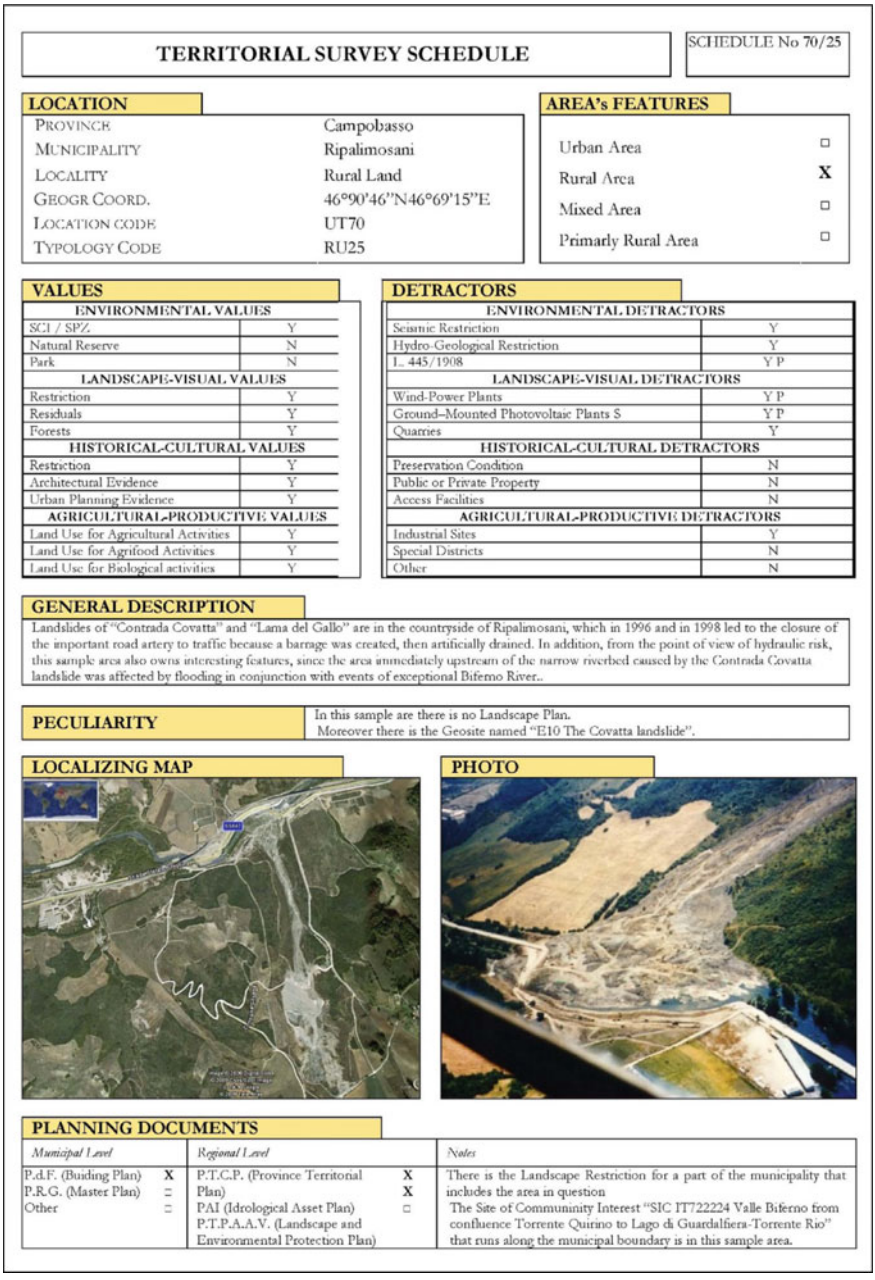
the area of the "Lama del Gallo" viaduct from branch B of the State Road n. 647 involving the prolonged closure of the road, the demolition of the unsafe batteries and the construction of a temporary by-pass.

The problem of the Molise region is always in connection with the road infrastructures: also bridges exactly along the Biferno River during the long time suffered serious crisis, as some ancient descriptions show: "The long course of the river is a cemetery of Roman bridges, Aragonese, carolini. Isolated pillars, broken arches that keep a fragment of the sixth like a rostrum. For about forty years from 1845 to 1881 the Biferno no longer had a bridge; for forty years of summer the river was ford. These steps of fortune were possible in summer and autumn: in winter they became very difficult if not impossible. Then the countries of the left bank remained cut off from the world. The Biferno had the power to upset the laws of time: the long winter with the snow that buried houses and fields became one interminable day." (Jovine 1941).

For the second factor, there are some troubles about new providing ground photovoltaic plants: the project consists in the realization of a grid-connected "ground" photovoltaic system for the production of electricity with a nominal power of 3 MWp. The plant will interest an area of about 10 ha, in the Municipality of Ripalimosani: it will work in parallel to the medium voltage electricity distribution network, totally releasing electricity to the grid (Ripalimosani 2013).

About the third factor, there are some interesting new actions for agricultural activities. The most important is the Project of the "VI.NI.CA. s.r.l. Società Agricola": it is a project that was born in 2008, where uncultivated and abandoned lands, suited for sustainable and natural agriculture they return to bear their fruits. Together with the vines, the company grows olive groves and vegetables for a total area of 220 ha in biological conversion. "The company works with conservative cultural techniques and only with the use of products natural both in the vineyard and in the cellar. The grapes are harvested manually and fermentations start thanks to indigenous yeasts. There is no pushed temperature control, yes use products for the extraction of aromas to clarify, and for keep in wine all the characteristics that the grapes gave us not we perform no filtration. Aware that working in this so our wines will be the pure expression of the territory" (www.vinica.it).

Certainly, we have seen that the city's Master Plan, following the disaster of the late nineties, has however downgraded the areas most at risk landslide, declaring the area in large part as not usable for building. But in a territorial project aimed at safeguarding but also at development, it is fundamental to read, for individual municipalities, through a matrix that examines and compares values and detractors, according to the methodology proposed by us for the New Regional Landscape Plan, illustrated here. Therefore, the form filled for the area under examination is shown below (Fig. 3).



TERRITORIAL SURVEY SCHEDULE

SCHEDULE No 70/25

LOCATION

PROVINCE	Campobasso
MUNICIPALITY	Ripalimosani
LOCALITY	Rural Land
GEOGR COORD.	46°90'46"N46°69'15"E
LOCATION CODE	UT70
TYPOLOGY CODE	RU25

AREA's FEATURES

Urban Area	□
Rural Area	X
Mixed Area	□
Primarly Rural Area	□

VALUES

ENVIRONMENTAL VALUES	
SCI / SPZ	Y
Natural Reserve	N
Park	N
LANDSCAPE-VISUAL VALUES	
Restriction	Y
Ressduals	Y
Forests	Y
HISTORICAL-CULTURAL VALUES	
Restriction	Y
Architectural Evidence	Y
Urban Planning Evidence	Y
AGRICULTURAL-PRODUCTIVE VALUES	
Land Use for Agricultural Activities	Y
Land Use for Agrifood Activities	Y
Land Use for Biological activities	Y

DETRACTORS

ENVIRONMENTAL DETRACTORS	
Seismic Restriction	Y
Hydro-Geological Restriction	Y
L. 445/1908	Y P
LANDSCAPE-VISUAL DETRACTORS	
Wind-Power Plants	Y P
Ground-Mounted Photovoltaic Plants S	Y P
Quarries	Y
HISTORICAL-CULTURAL DETRACTORS	
Preservation Condition	N
Public or Private Property	N
Access Facilities	N
AGRICULTURAL-PRODUCTIVE DETRACTORS	
Industrial Sites	Y
Special Districts	N
Other	N

GENERAL DESCRIPTION

Landslides of "Contrada Covatta" and "Lama del Gallo" are in the countryside of Ripalimosani, which in 1996 and in 1998 led to the closure of the important road artery to traffic because a barrage was created, then artificially drained. In addition, from the point of view of hydraulic risk, this sample area also owns interesting features, since the area immediately upstream of the narrow riverbed caused by the Contrada Covatta landslide was affected by flooding in conjunction with events of exceptional Biferno River..

PECULIARITY

In this sample are there is no Landscape Plan.
Moreover there is the Geosite named "E10 The Covatta landslide".

LOCALIZING MAP

PHOTO

PLANNING DOCUMENTS

Municipal Level		*Regional Level*		*Notes*
P.d.F. (Buiding Plan)	X	P.T.C.P. (Province Territorial	X	There is the Landscape Restriction for a part of the municipality that
P.R.G. (Master Plan)	□	Plan)	X	includes the area in question
Other	□	PAI (Idrological Asset Plan)	□	The Site of Communinity Interest "SIC IT722224 Valle Biferno from
		P.T.P.A.A.V. (Landscape and		confluence Torrente Quirino to Lago di Guardalfiera-Torrente Rio"
		Environmental Protection Plan)		that runs along the municipal boundary is in this sample area.

Fig. 3 The schedule for the Covatta landslide area. *Source* lab.lacosta elaboration 2017

4.1 The Investigation Schedule

Figure 3 shows the sample area of the Biferno course, analyzed through the indicators and their elaboration aimed at achieving the aim of the "quality transformation". The schedule, named "Territorial Survey", is devoted to the identification of values and detractors. Research activities were carried out in order to obtain the recognition of historical, natural, physical and aesthetic values and their interrelationships, moreover dynamic transformations of the territory were analyzed in order to identify homogeneous areas characterized by different landscape value levels in the Molise landscape. Our work was most conspicuous for the data collection of spatial information for regional areas actually not included in Territorial Landscape Planning. The first part of our engagement, in fact, was oriented to collect these data, especially for areas around Campobasso and Isernia. Data collation, arranged as above described, was carried out in view of territorial analysis that took into account both positive and negative elements in order to analyze, subsequently, the quality of the landscape. In practice elementary data was collected and divided according to the resource systems which describe the actual state of the territory.

The second phase was carried out in order to identify the landscape quality aims, in order to allow a future articulation of the new landscape Plan, which can aim at the identification of conservation measures of connotative features of the landscape and the determination of interventions recovery and rehabilitation of severely degraded areas. Therefore it proceeded to the definition of a methodology useful for the identification of regional territory through territorial matrices. We selected two different horizons, time and spatial. For each of them are defined: preliminary analyses, main stakeholders, finally aims. As regards to the "time horizon", the first step was oriented to accord three different point of view: the *current protection*, through the transformability set by the landscape plans actually in force, *the evolution of the land use*, related to the 50s to date, and finally the *perspective of prediction*, or how the ordinary planning tools—which in Molise are basically plans at the municipal level—provide (Regione Puglia 2010; Poli 2012).

Moreover, these elements have been synthesised into two large groups, Values and Detractors. The values are elements which confer worth to the total landscape system (such as architectural, naturalistic, historical elements). They include elements of great naturalistic worth, that is the presence of particular species of flora and fauna. They are: the Important Bird Areas and the Special Protection Zones (at the sense of the Directive 79/409/EEC), the Sites of Community Importance (at the sense of the Directive 92/43/EEC "Habitat" adopted in Italy by the D.P.R. 357/1997), the Beaches free (Data are required by the Plan for Use of State Coastal Property for Tourism and Leisure of Molise Region), the Areas restricted under Law 1497/39 and under Law 431/85. What remains of areas of great natural worth and are the historical memory of these places are also included. They are Residual of dunes areas; Residual of green pathways, Residual of woods' areas. However, if values highlight landscape qualities, detractors penalize them. The detractors list was prepared after detailed land use features analyses. We undertook our analysis in ArcGis field: the detractors

have been represented through graphics primitives with its geographic coordinates. Later, shapes for each detractor typology were realized.

This integration—between natural features and their awareness—has been made possible by the realization of a G.I.S. dedicated in order to integrate different types of data. The choice to realize the G.I.S. was determined by its intrinsic characteristics as an excellent management tool, for processing and querying of spatial data. After collecting all data they were collected in a geodatabase. This tool includes different types of data that have been integrated together to create and process maps through geographic analysis. The construction of a G.I.S. has the dual aim of creating the actual state maps and of creating a valuable support in the ordinary management of the phenomena. The G.I.S. has been realized with georeferenced information, while the geodatabase is composed of data in relation to the geographical location, the size, the land, detected through our schedules. This data could meet that of controlling the territory.

5 Conclusions and Remarks

The analysis carried out demonstrates the need to set up a reading methodology for the landscape which, although starting from data collection based on a homogeneous approach, in reality must always be adapted to local realities, even within the same region. The ultimate goal is to create vital landscapes. With a view to improving the quality transformation, we set up our own landscape, and landscape information and evaluation models.

The river has proved to be an extremely qualified example for the verification of the methodology aimed at the sustainability of the interventions that, on the territory that the river involves, can be realized.

Water is a perpetual element, but its performance varies in time and space: the river is an element that over time has changed its connotations, often changing a large amount. But the river is also a permeable element. And the purpose of the application of our methodology consists in the evaluation of the possible transformations from the point of view quantitative and qualitative, always with the quality transformation aim. The landslide, an element that characterizes the area in question, is certainly an element of instability, but it is also an element of strong perceptive value and it is located in the landscape with strong naturalistic connotations but in which attractive activities can be further encouraged (starting from some already successful achievements, which have been mentioned in this text). Watercourses carry out, within the territorial eco-mosaic, fundamental functions of specific ecosystem and ecological connection, as well as representing an essential functional element in order to maintain the environmental balance both physical and biological of the area, but it is also useful to implement sustainable actions.

Our work for the Landscape Plan was performed in two different scales: at the territorial level and at the local level, that is the municipal level.

At the territorial level, the indications, that are shown in the cards relating to

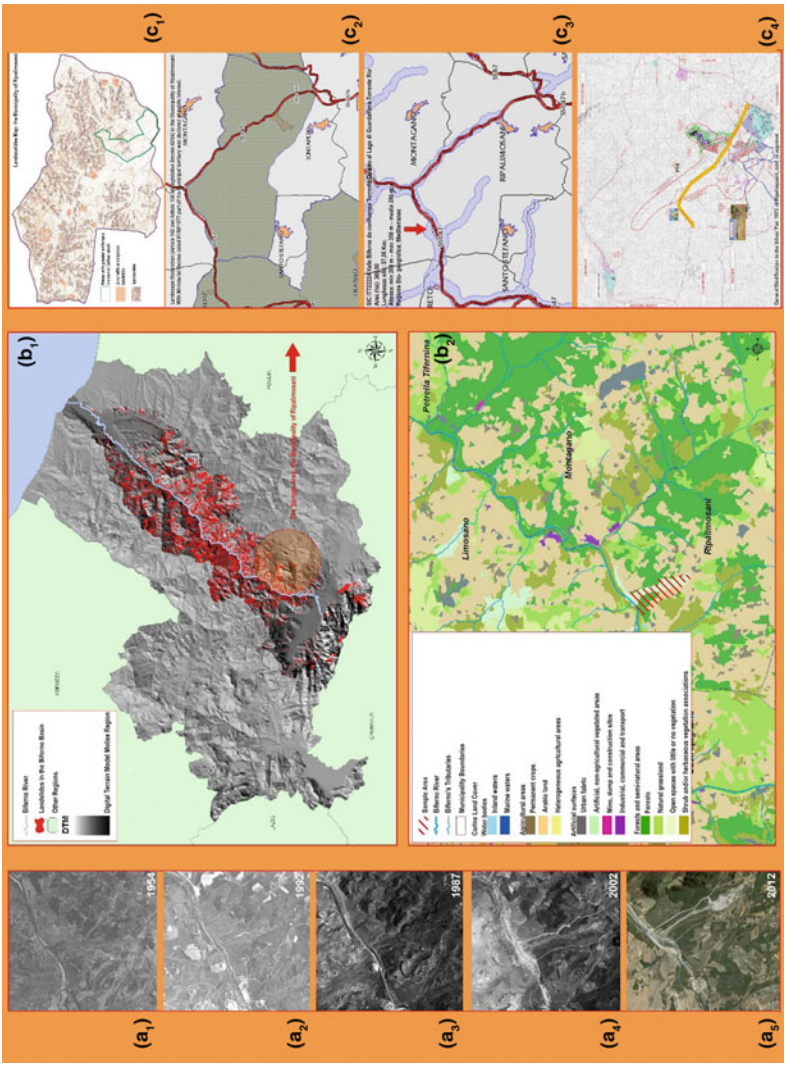


Fig. 4 The sample area of the Covatta Landslide. *Sources* $\mathbf{a_1}$–$\mathbf{a_5}$ orthophotos 1954, 1992, 1997, 2002, 2012; $\mathbf{b_1}$ digital terrain model of the molise region; $\mathbf{b_2}$ land use from Corine Land Cover 2012; $\mathbf{c_1}$–$\mathbf{c_3}$ strategical environmental assessment 2017; $\mathbf{c_4}$ master plan 2017, lab.lacosta elaboration 2017

Table 1 The landscape quality aims, general and specific, declined for the five resources systems (*source* lab.lacosta elaboration 2017)

Resources systems	General aims	Specific aims
Physical-environmental system	1. Promote the preservation of the integrity of areas of high naturalness and high ecosystem value	1.1. Safeguard geological-geomorphological systems with high integrity (especially referring to the geosite)
		1.2. Safeguard protected areas and areas of high environmental value such as those covered by the Nature 2000 Network
		1.3. Safeguard and improve environmental functionality of river systems of Molise
		1.4. Safeguard and rebuild habitats of Molise (especially for river course)
		1.5. Safeguard woods and forests of mountainous and hilly areas of Molise
		1.6. Redevelop and redesign the hill landscapes of Molise
Landscape-visual system	2. Promote improved integration of landscape and the quality of infrastructures	2.1. Define territorial and landscape quality standards in the settlement of new network infrastructure
		2.2. Define territorial and landscape quality standards in the settlement of new energy infrastructure
		2.3. Define territorial and landscape quality standards in the settlement of new productive activities
		2.4. Feasibility study for the definition of administrative attention naturalistic qualification of existing infrastructure at sensitive areas

(continued)

Table 1 (continued)

Resources systems	General aims	Specific aims
Historical-cultural system	3. Promote the preservation of cultural values	3.1. Preserve cultural value and witnesses of settlements and historical settlement
		3.2. Preserve cultural value of traditional rural buildings
		3.3. Preserve the visible cattle-tacks residual
		3.4. Redevelop the historic rural landscapes
Agricultural-productive system	4. Promote the conservation of agricultural landscapes	4.1. Develop the agricultural landscape of Molise, recognize and promote its social functions
		4.2. Preserve open landscapes of the hill territories
		4.3. Redevelop the agricultural landscape of Molise
		4.4. Promote new initiatives in order to valorize the inner landscape
Demographic-touristic system	5. Promote the improvement of the quality of the settlements	5.1. Improve quality of urban settlements and their environmental performance, for greater well-being of the population
		5.2. Redevelop degraded contemporary urbanization landscapes
		5.3. Improve urban quality of and touristic settlements
		5.4. Improve urban quality of agricultural and productive settlements
		5.5. Improve soft mobility quality (walking, cycling, trekking on horse) and its interconnection with the traditional mobility

the ten areas identified by the Landscape Plan, are intended to address and propose planning actions.

At local level, the municipal plans should act in accordance with the landscape plan suggestion: within the areas mentioned above, different situations are identified (in relation to the features and values of the natural environment and human actions) that require specific norms and guidelines.

In particular, for the area under study, a Landscape-Environmental Regeneration Plan will be recommended (thus including both the interventions from the environmental point of view and those from the point of view of the landscape quality improvement.

The greatest attention was paid to the variations foreseen by the General Modification of the current Master Plan (see Fig. 4 and Table 1). In the Fig. 4 evolution of the landscape in our sample area is shown: orthophotos from 1954 to ourday (a1–a5) and pictures b1 and b2 revealed the current land use, fruition and enhancement of resources in connection with the orographic status and the strategic planning tools (c1–c3).

In the Table 1 the landscape quality aims, general and specific, were declined for our five resources systems: the proposed actions are organized for the ordinary maintenance and management of river territories in connection with the land uses otpimization.

The overlap of the current and forecast condition also allowed us to have an immediate (and quantifiable) perception of dangerous, intense, extensive and persistent modifications, especially where there is neglect and poor preservation.

The conclusion could be that even the municipal administrations promote, as is already happening in some other regions, an active tool for the protection of the landscape within their municipal planning tools, in compliance with what is defined by the Regional Landscape Plan. This tool must naturally understand how the individual management tools for parts of their territories already foresee, but further implement them in a more specific logic for urban planning.

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