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The cover image is Rue de Rivoli - an emblematic street of Paris connecting Bastille to Concorde – that since May 2020 has been reserved for bicycles and pedestrians, Paris, France, Saturday, Nov. 6, 2021.

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The river contract in urban context as a new network of experiences

New opportunities in the post pandemic era

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Abstract
The river contract can be identified as a process, linking different intervention scales, able to solve the complex system of relationships between all involved components. In the landscape improving interventions, the River Contract is a new opportunity to experiment innovative planning and design approaches for fragile territories. Due to climate change, they have become favourite settings to simultaneously implement territorial and local strategies. This paper concentrates in particular on the European panorama and tries to deepen the analysis of some test areas in Italy, proposing a methodology to compare their applications and their relationship with the planning tools in force.

Keywords
Landscape; River districts; Strategic and local planning tools; River contracts.

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1. Introduction

Landscape issues influence the inhabitants of urban areas and, subsequently, their quality of life. The waterways have always given structure to the landscape and human activity has induced further changes and modifications, from the structures linked to agricultural activities, to reclamation operations, to regimentations, to the exploitation of the valley floors, to settlement interventions. Throughout Europe, analysing the last two millennia, river landscapes have been attacked by operations such as deforestation, drainage of swampy areas, with widespread erosion or sedimentation phenomena, which have led to an immeasurable expansion of hydrogeological risks. Furthermore, there are numerous rivers that cross the cities, which have seen the relationship and interaction between physical, economic, and social dimensions in the territory change over the centuries. The international debate addresses all these issues with a further concern due to climate change by developing adaptive theories.

In the most recent years, the will to counter this rampant phenomenon has been outlined at European level: starting from the "European Strategy on adaptation to climate change" (European Commission, 2013), to the document drawn up by the European Environment Agency (EEA, 2013), up to the Italian national drafting of the "National Strategy for Adaptation to Climate Change" (Repubblica Italiana, 2015), from which the "National Plan for Adaptation to Climate Change" was derived, widely shared by all Italian regions in 2018, with the aim of normalising risk management related to climate change. In this context, the territories crossed by watercourses constitute a field of application of great interest, for climate adaptation purposes and represent an additional opportunity in the post-pandemic landscape. Although both the National Plan and the related Regional Strategies should not be an additional super-level imposition, it is necessary to pay attention to the local level institutions which, with a multilevel government, are responsible for the adaptation of their urban planning tools. A field of interest, which still needs further investigation, is that of instruments linked to voluntary participation, including the River Contracts (RC). The investigation presented here contains some reflections, emerging from the preparation of the next National Committee of River Contracts.

In the Steering Committee Assembly, of which the first author is a member, a Discussion Document was prepared, aimed at the inclusion of the RC in the new national and regional programs. Currently, the RC has an important role in the implementation and improvement of local government policies: the participation of all the institutions involved in the management of water bodies - in particular rivers - allows the addressing of a multiplicity of aspects, hydraulic, agricultural, urban planning and economic (Bastiani, 2019; Cialdea, 2020a, 2020b).

An important achievement of the Committee, obtained in 2016, was the introduction of *art. 68bis* in the Italian Environmental Code in the third part "Regulations on soil protection and the fight against desertification, protection of water from pollution and management of water resources" (Repubblica Italiana, 2019), which states that river contracts contribute to the definition and implementation of district planning tools at the river basin level, such as "voluntary strategic and negotiated planning tools that pursue the protection, correct management of water resources and enhancement of river territories, together with risk protection, contributing to the local development of these areas ". And subsequently, in 2020, again with the support of the Committee's activities, the resolution on the River Contracts (Camera dei Deputati, 2020) was unanimously approved by the Environment Commission of the Chamber of Deputies. This resolution confirms the issues stimulated by the recent Assemblies, held in the three sessions of the month of July 2020 in preparation for the next 2021 Committee (Bastiani, 2020). Ultimately, with the support of the recent world forum on the theme of planet safeguarding (World Economic Forum, 2019), defines river contracts as forms of agreement that allow "the adoption of a system of rules based on public utility, economic performance, social value and environmental sustainability "; also hopes that the government will support the RC tool due to its ability to produce participatory action programs with concrete territorial repercussions, providing for easier access to the funds of the National Recovery and Resilience Plan and to the resources of the Recovery Fund.

Certainly, the RC does not yet have the structure of a planning tool, but it proposes itself as a facilitator of the projects for landscape transformations. The stakeholders act by virtue of the related tools' ordinances and of a panorama of plans and programs, varying greatly from region to region and with significant differences also for the landscape transformation control through the Landscape Plan.

The European Landscape Convention, signed in 2000 and to which European states continue to adhere today, has just turned 21 (Council of Europe, 2000). Despite the clarity of its principles, the fundamental problem seems to be its application: the European Landscape Convention expects individual European States to develop their own evaluation methodologies aimed at the management of their territories, which are, therefore, applied to the different geographical contexts. What is stated in the first article of the Convention, however, clearly highlights the limits of the interpretation of landscape interventions. It defines what is meant by "landscape management" ("Landscape management" means action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonise changes which are brought about by social, economic and environmental processes) and for "landscape planning" ("Landscape planning" means strong forward-looking action to enhance, restore or create landscapes). In the Italian language this difference cannot specifically mean only actions but has to refer to the entire planning process. Therefore, such as landscape policies that should derive from the Convention itself, often do not consider conservation aspects, provided that specific measures are implemented to protect, manage and plan landscapes (Busquets Fàbregas & Cortina Ramos, 2017; Roe, 2007; Council of Europe, 2017).

The fundamental issue is how these policies fit into the planning tools framework of each country, and then how the State favours their implementation through regional strategies, which are also always diversified. This problem is emerging particularly in Italy, where the sectoral planning tool - the landscape plan - provides for vast area knowledge: it aims to intervene on it, according to the Convention's principles, proposing an instrument suitable not only for the protection but also the development of the territory. In fact, according to national legislation, it is entrusted to local authorities, and the regions must draw up the plan, with a view to co-planning, not well specified and often disregarded, with the Ministry of Cultural Heritage.

The research, therefore, concerns the topic of the river landscape's fragility, to define possible solutions to the complexity of the "river" theme, which concerns not only the physical dimension but also from an institutional viewpoint. The literature - with texts and articles relating to principles and samples - constitutes the article backbone and it is constantly examined in its drafting. This paper undertakes a research path by combining considerations related to theoretical issues and to practical interventions, carried out on waterways by different nature processes. The main goal is to point out the River Contracts process in order to implement the Landscape Plan issues.

This paper is divided into four sections: the introduction (Section 1) describes the main issues of the paper, including the literature review. Section 2 defines the methodology, which also includes an explanation of choice of the proposed participatory process. Section 3 explains the results and section 4 contains the conclusion, geared towards stimulating future research.

2. Methodological Approach

The literature dealing with the relationship between river, landscape and the city is extensive. This paragraph reports the results of the authors' considerations in relation to the contemporary debate and related adopted methodologies of territorial surveys.

2.1 Fragility & Complexity

When it comes to river networks, a substantial aspect is their character as fragile and complex territories: fragile in that they are crossed and conditioned by ecological, climatic, and anthropic features; complex because in them the question of landscape protection (environmental dimension) and the question of urban

liveability (urban dimension) meet and clash. To define these characteristics, it was decided to investigate beyond national borders, through case studies where state and regional interventions provide virtuous approaches to the characteristics of fragility and complexity of river landscapes.

The different aspects of fragility denote a complexity in river landscapes: different environmental and urban dimensions, material and immaterial relationships, natural (ecological) and anthropic (historical-cultural) networks. When it comes to fragility, therefore, it is necessary to address the issue of complexity. In the specific case of river networks, it is closely connected to the landscape and to the interpretations given by different schools of thought (developed in the United States). These attempt to re-read urban environments from a landscape perspective, combining - both etymologically and in "substance" - landscape and urban planning (Landscape Urbanism- LU), hidden natural systems and man-made environment (Ecological Urbanism- EU), natural networks and human networks (Infrastructural Urbanism- IU). These try to explain the physical complexity of the interrelation between river and people, between natural processes and human activity, between the landscape and the city and they see the latter as the set of interconnected ecological elements (Turner, 1996; Connolly, 2004; Shane, 2004). A different vision for city planning is therefore defined in which the landscape replaces architecture as a basic element of urban planning, becoming both the objective and the means to represent and build the contemporary city, suggesting a new field of operational possibility (DKKV, 1997; Waldheim, 2006), in which the landscape offers the double opportunity to reformulate urban problems and recontextualize the practice in general (AALU, 2017). It is precisely in practice that one must try to overcome the visual limits of the "landscape" object itself (Mostafavi & Najle, 2003) and instead define a modality of intervention that sees the individual elements as nodes of a wider network (ecological networks). For this to be possible in the design and planning of open spaces, the landscape must be the structuring means, proposed as an initial step rather than a final step (Gray, 2011). These theoretical bases guide the regeneration of coastal and riverbanks, green infrastructures, and urban voids, as evidenced by the Manhattan waterfront project on the Hudson River, developed in the 1980s. The waterfront was largely an abandoned landscape with dilapidated docks, parking lots, and warehouses.

After the decline of maritime trade and the collapse of a section of the West Side Highway, a lot of attention was paid towards deteriorated infrastructure in New York and the Westway project was created. This project planned to fill a portion of the Hudson River to create an underground interstate highway. The plan was unsuccessful, but there was the opportunity to reinvent this area by creating a park, enhancing its relationship with the river. Hudson River Park was established in 1998 through the Hudson River Park Act and is now managed by the Hudson River Park Trust, a unique partnership between the City and New York State. It promotes numerous projects at various scales that aim to make the river a landscape element of great ecological importance compared to the strongly urban character of Manhattan and New York. The design and construction of the Park are not yet completed and have been included in the Vision 2020 for New York, to define the activities related to Natural, Public, Working and Redeveloping Waterfronts (City of New York, 1992, 2011; Quercio, 2014). In this project, the key issues of the LU, EU and IU approaches emerge, such as the environmental dimension of the city in its relationship with ecological elements, the importance of biodiversity conservation of the ecological element, the urban dimension of the river as a connecting element and the creation of public spaces to improve quality of life and well-being in the city.

Complexity, in its components of theoretical complexity - which affects the disciplinary debate - and of physical complexity - which emerges from professional practice - totally involves urban and suburban systems (Vercelloni, 1992; Farina, 2004; Arcduecittà, 2013).

On the other hand, in the case of territories that are crossed by large green or blue infrastructures, such as wooded areas or river networks, the aim is to combine urban growth with environmental protection, emphasizing the ecosystem and social amenities provided by green spaces in cities, such as regulating temperatures, conserving native species, wind corridors, air purification, noise reduction, providing alternative

transport routes and effective spaces for running, walking or cycling (Allen, 1999; Tsenkova, 2016; Allen et al., 2017). Furthermore, complexity is also augmented by climate change (CC), which increases the level of complexity both on a theoretical level (supporters and non-supporters of climate change and its influence on the environment) and on a practical level (dealing with the consequences of change) (Gill et al., 2007; Kelbaugh, 2019). A project in line with this evolution of complexity that faces the relationship between LU, EU, IU and CC is the Resilient New York strategy, promoted by the municipality of New York on the Atlantic coasts. It is part of the PlaNYC, a sustainability plan for long-term city development based on climate science. The plan includes ideas on how to rebuild New York communities affected by Hurricane Sandy in 2012 and how to increase the resilience of natural and man-made infrastructure throughout the city to protect it from extreme events (City of New York, 2013). The strategy led to the enhancement of existing and newly built urban parks (Hunters Point South Park, Brooklyn Bridge Park, Freshkill Park, East Side Coastal Resiliency, Living Breakwaters), as adaptation and mitigation systems for a city resilient to sea rise phenomena (NYCMORR, 2019; Zacks, 2019). The need emerges to broaden the gaze on river and coastal landscapes in relation to contemporary problems, as "planning" resilience (Angelucci et al., 2014; Morosini et al., 2018; Brunetta & Voghera, 2014).

The approaches of the above-mentioned theories (the "urbanism" approaches) can aim to enhance biodiversity conservation aspects or to support urban design, with a strong ecological component (Mostafavi & Doherty, 2010). To explain such theoretical approaches in terms of application, the most emerging elements for the planning of contemporary river landscapes have been analysed.

2.2 Landscape Features & Planning Issues

Fragility emerges more and more in relation to three essential aspects linked to river networks: the ecological aspects, the risks caused by climate change and the use by citizens - which depends on the attractiveness of the landscape itself (Ippolito, 2011; Indovina, 2015; Caprotti et al., 2017; Vitillo, 2018).

From an ecological point of view, the fragility of the river derives from its being a web of natural and semi-natural habitats and an interconnected system of spaces capable of safeguarding and improving the biological diversity of a territory, despite human activities and anthropization (Acierno, 2019). Extending the discussion to a network level, considering the ecological aspect means implementing various actions to keep river biodiversity and its systemic role intact. A concept of desirable balance between man and ecosystem has been in place since the World Conference on Environment and Development held in Rio de Janeiro in 1992, and it deals increasingly with environmental and ecological problems in relation to the sustainability issue (Smith TM & Smith RL, 2017; United Nations, 1992a, 1992b, 1997). In Europe, the Netherlands is a leader in managing the ecological fragility of river areas. Here the government has promoted wide-ranging national programs (Goossen, 2019; Rijkswaterstaat, 2020) for greater safety of river environments, focusing on water purification and naturalization interventions, which then become the basis for ecologically attractive natural areas not only for fauna or flora, but also for the urban communities that are located near it (Al Sader et al., 2020). The Room for the River, for example, is a program that was initiated after the floods of 1993 and 1995 and subsequently to Plan Stork, which focused on restoring dynamic natural processes in floodplains while meeting flood protection goals. Within this national program, the WaalWeelde Program (launched in 2006 by Radboud University) is focused on the floodplain area of the Waal river, the main branch of the Rhine river (Fliervoet & Van Den Born, 2016). One of the most successful projects of this program is the Gamerense Waard floodplain environmental recovery plan, which was used as a clay quarry and brick production area until 1980. When activity declined and after flood events it was necessary to rebuild the dam for the protection of the factories, which were later demolished. This left a large area heavily compromised and the river needing more space. The plain was therefore transformed into a nature reserve and the Waard River was left free to extend through secondary channels. This intervention has led to the proliferation of a great variety of flora and fauna, allowing

nature to help the area recover (Mak, 2013). At the ecological level, therefore, the balance between man and ecosystem is considered the basis for increasing the efficiency not only of the river system, but also of the urban system, favouring the maximum habitability of places (Monguzzi, 2019) and that is why interventions to restore the natural ecological level of river networks are generally aimed at the re-naturalization of abandoned quarries, the conservation of wetlands and purification systems for polluted waters.

Ecological fragility is also closely connected to flood phenomena, which are increasingly violent today, leading to the flooding of rivers and the consequent risks in urban and semi-urban areas. The anthropic transformation of the landscape has in fact often changed the courses and riverbanks, making the risks associated with floods more frequent, which however are natural events to which humanity has always been and will be subject. The most proactive and interesting approach to address ecological fragility is that of risk mitigation through land use planning, which influences the uses of the areas and which has led to the growing interest in Nature Based Solutions (NBS), with interventions such as expansion tanks or rolling basins for the containment of river floods and the protection of surrounding inhabited centres (Gobattoni et al., 2016; Kabisch et al., 2017; IUCN, 2019; Somarakis et al., 2019; European Commission, 2015).

In this regard, Germany has implemented virtuous actions to address the fragility of river landscapes following flood phenomena (Zimmermann et al., 2015), as happened for the Elbe River which in 2002 caused extensive damage to the surrounding areas. This event led to an integrated flood risk management system across the nation. Many cities have initiated projects for the safety of the city and the riverside, even after other widespread flood events (Thieken et al., 2016). The German Commission for Disaster Reduction has drawn up a report which collected all the "lessons learned" from this situation, with the aim of limiting human interference on the floodplains. To further strengthen this strategy, the Federal Ministry of the Environment established a national protection program in 2014 to identify potential reactivation areas of floodplains and new polder areas of national significance. One of the most effective strategies at the local level, in response to national planning guidelines for risk management, is the Flood Management Concept, implemented in various cities in Germany (DKKV, 2004). In the town of Miltenberg, the Flood Management Concept (2009) created new riverbanks on the River Main on two levels, one level with the river, with paved promenades, rest and panoramic areas, and naturalistic areas, and one on an upper level, where the safety of urban activities is guaranteed. The protection systems of the town of Worth am Main, on the other hand, are of a different nature, where in 2001 mobile solutions integrated with the buildings and an extended dam designed as a park were created, where the barriers constitute a design element that close as if they were a gate for flood protection of the Main River (Prominski et al., 2012). These cases highlight how direct interventions on river networks, especially through the NBS, can face the "alluvial" fragility of river landscapes, trying to transform their intrinsic problematic and negative character into a propositional and positive one.

For this to be possible, however, it is necessary to consider the attractiveness of the river landscapes. Since the birth of cities, rivers have represented the place of historical memory and the place of life par excellence, also undergoing phases of underutilization and reduction of their value (Jacobs, 1961; Sairinen & Kumpulainen, 2006; Ercolini, 2012; Cialdea, 2020c).

In response to natural phenomena (such as floods) that involve the river and uproot the river context, inhabitants are often passive in their attitude, almost a sort of impotence, which we have called "human fragility". The regeneration of rivers has become an element of investment attraction that is used to ensure greater safety: they also produce positive effects on city image but also on human well-being (Van Der Knaap & Pinder, 1992; Sahar & Ibrahim, 2018; Cialdea & Pompei, 2020).

In Europe, Hamburg is a city that has implemented effective planning strategies for the transformation of the river network from an exclusive trading network to a network of cultural, economic, and environmental attractiveness. The beginning of the post-industrial period made the authorities rethink the image of the city in terms of river urban landscape. This was necessary after the decommissioning of industrial and port sites,

linked to the transition that took place throughout Europe from a Fordist industrial society to a post- industrial one with strong outsourcing (Donnarumma, 2013; Lepore et al., 2017). The port-city, which developed at the beginning of the 9th century, is crossed by a network of canals and three rivers (Alster, Bille and Elba) and the first measure to regenerate 6 km of waterfront of the Elbe was put in place in the 1980s. Starting from the 90s, the revitalization and regeneration of the riverfront has moved towards newly built areas, one of the best known being Hafencity (Schubert, 2016). The project created a new district in the heart of the city and the Masterplan was approved in 2000. What makes HafenCity an innovative regeneration model for the resolution of the "human fragility" of river areas is its interaction between planning, design and implementation that has led to the completion of the project ten years after approval, involving a great variety of stakeholders. The results obtained have endowed the area with an architectural and urban quality in line with the idea of a sustainable city (Mazzoleni, 2013). The mix of commercial and leisure uses have created an area surrounded by water capable of reconnecting the dimensional scale of the historic city with the complexity of relationships and the variety of functions typical of the contemporary city (Clemente, 2011). By paying attention to tree species, stopping points and meeting places and panoramic or floating terraces, tourists and residents can enjoy the new Hanseatic city rediscovering its fluvial dimension.

The above mentioned examples are not models to be followed blindly but are able to transform fragility and complexity into innovative river landscapes.

Their critical analysis aims to provide new perspectives for planning and designing fluvial and coastal landscapes in a more extensive vision than those dealing only with individual countries.

In this first phase, an attempt was made to define urban planning elements, deriving from the different theories on city interpretation, from a landscape viewpoint.

These elements seek to provide operational solutions to the characteristics of fragility and complexity that constitute the landscape as an urban ecosystem (Tab.1).

Territorial Elements	**Theoretical Approaches**			**Urban Elements**
Landscape Features	**Landscape Urbanism**	**Ecological Urbanism**	**Infrastructural Urbanism**	**Planning Issues**
Fragility	Relationship with nature	Ecological networks and Biodiversity	Natural networks	**Ecology**
	Flood risks	Ecological safeguard	Natural ecosystems	**Risks**
Complexity	Institutional aspects	Relationship with human activity	Interconnected systems	
	Relationship with city	Interconnected systems	Social networks	**Usability**
	Anthropization	Biodiversity	Social infrastructures	

Tab.1 Theoretical approaches from landscape to the city

3. Results

Complexity affects the physical characteristics of river landscapes but involves the institutional environment even more, especially in plans and projects. Referring to the Italian context, an examination of some situations in the national panorama was carried out. They have been chosen as significant of different attitudes, to verify the River Contract capability to be a problem solver for issues identified in the paper's introduction.

In particular, the cases have been identified because of the coexistence of protected areas, already established or in progress, in river areas. This issue is currently the subject of specific reflections within a working group called "Parks for River Contracts", recently created, on the initiative of the RC National Steering Committee, of whom the authors are part of. On the national territory, in fact, there are numerous parks adhering to RC, but the situations vary greatly. In some cases, the park was the main promoter of the RC process, in others

the RC brought to the creation of a protected area, in other cases the pre-existence of a protected area has precluded the start of a RC.

3.1 Interventions: Italian case studies

The discussion highlights, therefore, how much the RC promotes interventions on rivers, and how often, instead, the RC is not set in motion, when there is a solid financial base and established protected areas. For the purpose of extrapolating the most recurring responses to the planning issues, four case studies have been chosen, which are part of a broader investigation (Cialdea & Pompei, 2018a, 2018b, 2019). They are the most representative in terms of operational responses for the resolution of planning issues: furthermore, these cases are in a very advanced state of implementation, compared to others, still in their initial steps.

The first case examined is that of the Sarca River Park, where important interventions have been carried out related to the ecological aspects of the river environment. A RC has not been implemented for this river, but there are many good practices, involving the participatory model to enhance environmental and cultural heritage. In this case, the driving force was the Reserves Network, a new tool introduced by the nature areas and forestry protection law (Provincia Autonoma di Trento, 2007). In 2012, a Memorandum was signed for the creation of the "Low stream Sarca Reserves Network", hoping to expand to the Upper Sarca areas as well. Subsequently, the Fluvial Park was established, whose mainstream is the Sarca Mincio Garda, and the Montano Imbrifero Basin Consortium activated a territorial participatory laboratory (Università di Trento, 2015; Pederzolli, 2020).

The redevelopment of the banks and the riverbed was implemented, with attention to the high environmental quality of these sites, which since the 19th century have been traveller hotspots for those coming from central Europe to Garda Lake. In this case it is evident how physical complexity is directly transformed into institutional complexity. It achieved a positive result, as it doesn't involve only the territorial basin but the whole river corridor, connecting the most significant areas from environmental and cultural points of view. In these ecological interventions, the Sarca connects "the largest glacier in Italy" to the "largest lake in Italy", ideally from the "Alps" to the "Mediterranean" (Comune di Arco, 2009; BIM Sarca Mincio Garda, 2012). The Reserves Network has multiple functions, also in relation to the improvement of environmental connectivity, between high naturalistic values and intense agricultural activities, which occur above all in the widespread areas of intense wine production (Provincia Autonoma di Trento, 2019).

A RC that was able to implement interesting actions related to river usability is the RC "Terre del Lamone" in Ravenna, of which the declaration of intent was signed in 2017. The "Lamone Bene Comune" project was developed with the aim of welcoming citizens' proposals for shared management of the river, for conscious tourism and for soft mobility. This RC presents similarities in the approach to the territory with the previous example: the riverbank is a united network of sensitive areas to be ecologically protected and enhanced in terms of use and knowledge for the population (Bissoli & Montaletti, 2018, Bagnari & Buganè, 2013).

The case of the Olona - Bozzente - Lura RC describes a completely different situation because the River Park project started from the RC. On a technical level, the Lura River has a low water flow; however with violent rain phenomena it immediately reaches flood level, causing devastating damage to all the surrounding areas. In accordance with the European Directives and Legislative Decree 49/2010 which establishes the Flood Risk Management Plan (Repubblica Italiana, 2010), the Lombardy Region has implemented various protection measures in Lura Park: two rolling basins (in-line and off-line), flood gates, shunts, and embankments, thus making the river basin safer (Innocenti et al., 2009). Attention was initially focused on the issue of risks, but then an interesting activity to increase population participation was created (Regione Lombardia ERSAF, 2015; Scaduto, 2016). The Lura sub-basin Project is a particularly compelling example because it is based on a widespread responsibility principle shared by various stakeholders (from citizens to local administrations, to businesses, to managers, to Parks, up to the regional government). The sub-basin Project represents the first

and fundamental result of a co-planning process of the river basin, in a local partnership with the Region. Other risk mitigation operations have been promoted by the recent RC of the Pellice Torrent Basin. The basin was studied for the Alcotra 2007-2013 Territorial Cooperation Program and aimed to analyse the hydrogeological structure and the environmental state. In particular, the European project had issues related to the study and management of the mountain stretch of Pellice from the hydraulic, geological and naturalistic point of view. It had promoted the collaboration between the territorial stakeholders, including the Turin Polytechnic as leader and the Turin Province and the Conseil Général Hautes Alpes as partners (European Commission, 2008; Conseil General Hautes Alpes, Turin Polytechnic, Città Metropolitana di Torino, 2019). The course of the river, therefore, also involves cross-border contexts: in this case France is involved, and financial support was provided by EU funding. The RC was recently signed (in October 2020) and provides for the implementation of three macro-interventions: water quality and quantity protection, banks and river area requalification and hydraulic risk mitigation (Regione Piemonte, 2020).Furthermore, the case of the Alpine Convention is intriguing, created with the aim of safeguarding Alpine ecosystems. There have been virtuous processes aimed at the sustainable management of water resources and promoting international cooperation. They have also resulted in the promotion of RC activities, such as that for the Roia river or that for the upper Adda basin (Angelini, 2017; Bianchini, 2014). Tab.2 underlines how different projects can face the urban planning issues with different actions coping with the territorial fragility and complexity.

Landscape Features	**Urban Planning Issues**	**CASE STUDIES RESPONSES**			
		***Sarca* River**	***Lamone* River**	***Lura* River**	***Pellice* River**
Fragility	**Ecology**	Ecological safeguard Biodiversity protection	Ecological safeguard Biodiversity protection	Ecological safeguard Biodiversity protection	Ecological safeguard Water quality protection
	Risks	Environmental connectivity implementation with human settlements	Environmental connectivity implementation with human settlements	Flood protection	Mitigation of hydraulic risks
Complexity	**Usability**	River ecological and cultural networks Tourism	Tourism Soft mobility	Participatory process Co-planning process	Requalification of riverbanks Institutional cooperation

Tab.2 Case studies analysis

These cases highlight how complex river contexts can trigger significant transformation processes, if involved in participatory processes. In the cases of trans-regional and cross-border river courses, the different approaches to river issues (ecology, risks, and usability) constitute a field of experimental and innovative solutions. To obtain these results, from the investigation it was also clear that the real issue for positive practices is the participation process, in which the RC can play an increasingly positive role.

4. Discussion and Conclusions: Towards a solution for complexity

The identification of the fragility and complexity concepts was functional to the research and it represents the innovative aspect of this paper. Fragility's principles, in the writers' opinion, are the basis of the main territorial transformations.

River landscapes are fragile territories, as physical boundaries and limits for the development of natural and human values; they represent areas of experimentation, in which people can be involved in the analysis, planning and design of space and ways of using it. The aim was to identify - from theories, projects, and policies - recurring functional elements to improve the national landscape planning tools. The sample analysis has been concentrated on areas close to protected areas or within them (preserved in various ways) or where

conservation prevails over development. In Europe and in the United States, the best solutions were found to be those in which the project aims to regenerate the territory around the river, to establish a reconnection between it and the landscape. The creation of ecologically safe enclaves, which transform existing infrastructures into flows of ecological resources, can guarantee strategic protection and further economic development, especially where the river could influence urban liveability. In these cases, it emerges that the decision-making and financial strength of one or more stakeholders was sufficient to set the regeneration in motion. In Italy, on the other hand, the most innovative solutions are identified in projects implemented by the River Contracts. In fact, the RC is configured as a process capable of integrating at various levels the theoretical, physical, and institutional fragility and complexity, which are interwoven with ecology, risk and usability issues. Institutional complexity is the prevailing problem at national level, and it determines the transformability of river areas. Italy is a peculiar context, because of the different planning levels that set several planning laws and tools to be respected for landscape and water management. This legislative condition is also another element of our ongoing research, with the aim of comparison with other nations' approaches, and their different institutional framework.

In this context, the River Contract is outlined as a possible way for the mediation of institutional complexity in a panorama of different urban planning tools, where the stakeholders are numerous and not sufficiently strong nor at the decision-making nor the financial level (Bastiani, 2011; Cialdea, 2020a; Cialdea & Cacucci, 2017; Ingaramo & Voghera, 2016). In resolving this complexity, the RC - although not yet clearly placed within the scope of spatial planning tools - has the potential to transform the river into an elective place for matching ordinary and landscape planning regulations. Of course, the landscape plan can be the tool for choosing a substantially different form of territorial planning from that of the participatory type, but which should be integrated with it for the practical implementation of any interventions. A fundamental role, therefore, is played by the Region's ability to further implement the vast area planning tools according to the Urbani Code (Repubblica Italiana, 2004): this could lead to an "integrated system" for the enhancement of "common goods" (Cialdea, 2019). It is purely in the implementation phase where it is necessary to work harder, encouraging relations with local stakeholders, such as administrations, sector authorities and the citizens. For this reason, an important role can be played by participatory processes. In this essay, in conclusion, an attempt has been made to highlight the aspects to focus on for proactive landscape planning. The aspects analysed - linked to ecology, risk protection and usability - can therefore play an important role in the structuring of fluvial planning guidelines, especially where the river constitutes an identifying element of the landscape.

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