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## River Contracts as Social Innovation Processes in Integrated River Basin Management in Europe<sup>1</sup>

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### *Abstract*

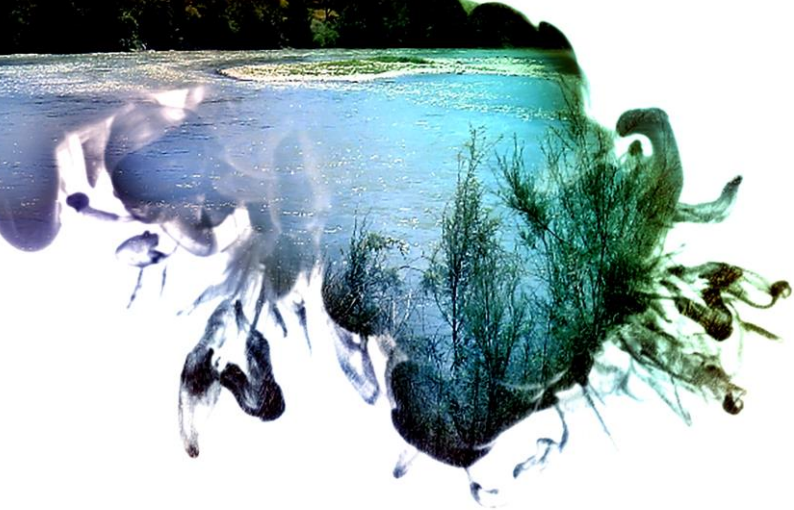
European River Contract (RC) have been demonstrating since 1980s their capacity of integrating voluntary-contractual agreements and other instruments of water resources management, urban and territorial and sectoral planning. Therefore, RC represent innovative 'places' and Social Innovation processes for allowing public government bodies and settled communities to actually participate in governance, management and exploitation of water/river ecosystems and territories, also in compliance with all EC directives issued during latest years and in full respect of the subsidiarity principle. The twofold legal-operational nature of RC – technical dimension and concerted approach – together with their evident diffusion across Europe and World, allows to identify these agreements not only as sectoral tools suitable for the Integrated Water Resource Management and water directives implementation, but also as catalysts of a new 'culture of water', recalling the deep interrelationships existing between water governance and management policy, hydrography, public health and socio-cultural values, and spatial planning.

### *Key words / phrases*

Integrated Water Resource Management, River Basin Management, River Contract, Urban and Territorial Planning, Social Innovation

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<sup>1</sup> This contribution prepared for the International Seminar on Water and River Ecosystems in the Urban Environment to be held on 23-25th November in Zaragoza (Spain), has been derived from a first updating review of primary contents of the Author's volume "River Contracts and Integrated Water Management in Europe" (2017, Springer-UniPA, Brief Series; <https://doi.org/10.1007/978-3-319-42628-0>), in which it has been issued for the first time the Author's PhD thesis "Planning fluvial territories. The river contract as an instrument for an integrated management at the river basin scale" – elaborated within the 23rd Cycle of Research Doctorate in Regional and Urban Planning (2009–2011) at the University of Palermo with a co-tutoring of the French University Lumière-Lyon 2. The aim of the published research work was at offering (I) an overview of the European legislative and procedural scenario, (II) a specific comparative analysis of the two paradigmatic cases of France and Italy, (III) an examination of the main application experiences of river contracts and their outcomes, and (IV) some reflections about the complexity of ecosystems linked to river basins, within which ecological instances and different uses of water resources still appear to be better harmonized, and so conflictual situations are continuously emerging, while new opportunities for shared projects between public and private actors are arising. All these items were the actual topics of the mentioned PhD thesis, first of all developed, indeed, in the direction of better and more deeply exploring the role of river contracts as key instruments to access new more sensible and water management modes, and to more directly involve river basin populations in design processes, firstly, and then in political and management decisions. That was, in other terms, to really understand the profound paradigm shift spreading in the whole Europe and World water management sector: from the early scholars', water domain experts' and politicians' focus – put just on principles of hydro-sedimentary functioning and that had mostly inspired previous water bodies restoration policies – towards renewed political and participative approaches, no longer by imposing compulsory measures dictated by central governments, but rather by (I) educating the citizenry to more context-aware policies for sharing water resources, (II) providing stakeholders and people with common cooperative tools, and (III) really supporting all them to proactively participate in decision-making processes, on the benefit of Integrated Water Resource Management innovative actions.



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## 1. INTRODUCTION

The diffusion of river contracts (RC)<sup>2</sup> is a phenomenon of great significance for the implementation of Integrated Water Resources Management (IWRM; see, among others, INBO 2009; Mees, Suykens and Crabbé 2017) intertwined policies, both in European and World horizons (INBO 2018). Since the first experiences undertaken in France in the 1980s, RC have acquired considerable flexibility and offered original solutions for problematic issues related to River Basin Management (RBM).

As well known, globally the interest in RC is spreading out since the Second World Water Forum (The Hague, 2000). The 2000 European Water Framework Directive (WFD) also gave an impetus to IWRM initiatives based on the specific RC initialization paradigm, stressing necessary organized forms of RBM through participatory processes, instruments for river basin planning and its opportune integration with all the other urban and territorial planning levels, and, first of all, having sanctioned the river basin as the reference unit for the implementation of IWRM policies, within what RC revealed actually to be one of the most suitable processes to be undertaken.

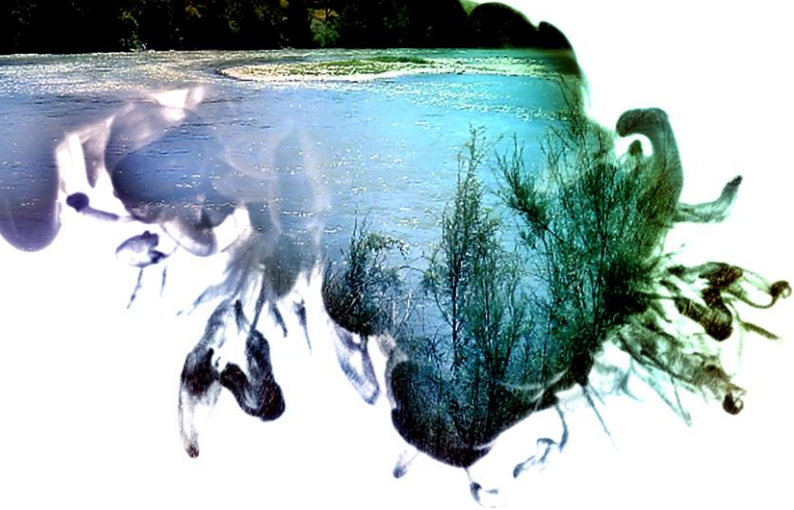
Along with all these fundamental reference points on the plane of EU water policy, two other theoretical-scientific and political-operational items play a primary role in the current WFD, IWRM and RBM implementation path, and also are specifically relevant to RC design and initialization: the above-mentioned topic of the river basin (otherwise 'catchment basin', 'catchment area' 'catchment scale') as the most suitable spatial unit for the implementation of water policies and actions (Blonquist 2008; Guerra 2013; Grizzetti et al. 2016; Mees, Suykens and Crabbé 2017; Räsänen et al. 2017; Scaduto 2017; AAVV 2018; EEA 2018); the ecosystem services concept/approach and ecosystem-based management, employed in many European and World water governance and management initiatives (Böck, Polt and Schülting 2018; De Stefano and Garrick 2018; Kuemmerlen et al. 2018).

Notwithstanding the diverse European and World contexts, and the local environmental and geo-political territorial differences, the river basin unit and planning scale have undoubtedly contributed to characterizing the RC legal and administrative profile as voluntary agreements, as well as highly concerted and inclusive instruments.

It is noteworthy, also, that up today RC implementation history across Europe and World can offer many stimulating, diverse case studies and, therefore, they should appear opportunely, as one of the fundamental items of the IWR manager's toolbox, into educational and professional training actions and programs.

In light of these premises, this paper intends to contribute to the scientific, institutional and technical debate, by updating and sharing some of the considerations reported in 2017 within the monograph *River Contracts and Integrated Water Management in Europe*, hereafter focusing on (I) legal, theoretical-technical items of RC and similar actions and instruments applications, (II) the state-of-the-art of RC in European urban areas, (III) primary aspects of their very integration with urban and territorial planning, and (IV) a possible early 'vademecum' for RC designers and project managers; all this to contribute in the evaluation of the actual impact of RC on river basins and their territories safeguard and management.

<sup>2</sup> As known, also named as *CdR – Contrat de Rivière* in French language areas, or *Contrato de Río* in Spain, or *CdF – Contratti di Fiume* in Italy; otherwise, more generally known as and recognizable in the various *agreements* signed by public and private bodies, with regard to a single river and/or its basin, a river network, and also a transboundary river and/or its basin.



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## 2. GENERAL FRAMEWORK ON RIVER CONTRACTS IN EUROPEAN WATER POLICIES, RIVER BASIN ORGANIZATIONS AND URBAN AND TERRITORIAL PLANNING

### 2.1 General legal aspects across Europe and World

For the purposes of the present contribution, it is deemed fundamental to highlight, first of all, the legal characteristics of RC, as they can be reported from the analysis both of historical and ongoing case studies, especially those ones undertaken in France, Belgium, Luxemburg, Switzerland, Spain and Italy (Bielsa and Cazcarro 2015; Scaduto 2017; Mees, Suykens and Crabbé 2017; de los Cobos 2018).

From a legal standpoint, it is very interesting to observe how actually converging policy measures, initiatives and actions in WFD, IWRM and RBM implementation have been undertaken across different European and World National scenarios (INBO 2009; INBO 2018), through some approaches and tools quite just namely diverse from RC, but, in fact, very similar to voluntary-contractual RC. With regard to this variety of water policy implementation instruments, undoubtedly RC present a very interesting and long genesis and historical path of rising and affirmation in sectors of IWRM and RBM, ecology, and urban and territorial planning.

As afore-mentioned, the first globally recognized definition of the RC paradigm was proposed during the Second World Water Forum (The Hague, 2000), focusing on their high applicability with reference to the concept of IWRM (Solanes and Gonzalez-Villarreal 1999; Brun and Lasserre 2006a, 2006b; Brun 2010).

As concerns their legal and contractual characteristics, the very identity of RC can be outlined through their specific characteristics well detectable across diverse European historical and ongoing experiences, that will be deeply analyzed within the extended version of the present contribution. Anyways, the legal intrinsic nature of RC hitherto syntetized has been representing – notwithstanding their typical voluntary-based initialization and implementation procedures – a strong anchor point for their explicit acknowledgment and legal-technical designation within different National and/or regional law and regulatory frameworks. That is what has concretely happened within some European water, environmental and spatial planning National policy contexts, undoubtedly also given inputs and resources due to WFD and the others relevant EU directives.

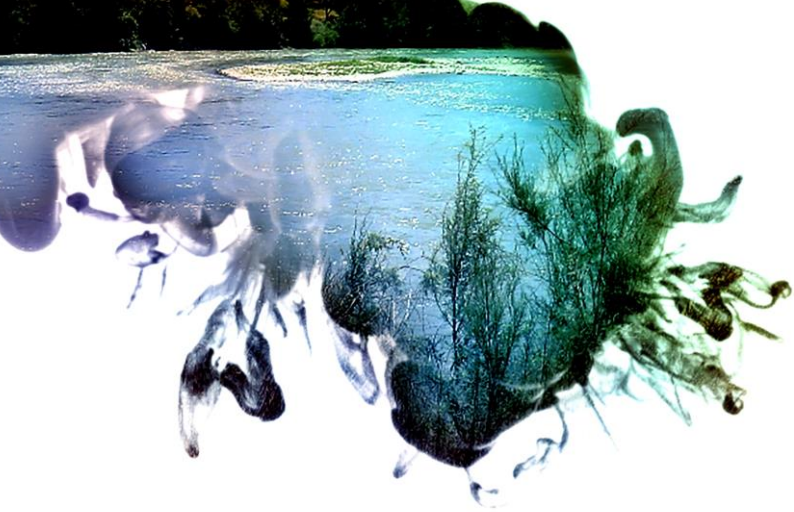
### 2.2 General theoretical and operational aspects underlying the RC approach

Even tough quite diverse in each National regulatory and operational framework, all European approaches to the RC paradigm have been sharing the five common components deemed necessary for WFD, IWRM and RBM implementation: (I) a single reference unit in terms of hydrographic basins or sub-basins; (II) knowledge of water resources and environmental, social and economic aspects correlated to their diverse uses; (III) voluntary acceptance of contractual instruments; (IV) coordination among all territorial players and actors; (V) the necessity of participatory processes and, especially, actual involvement of local communities.

The underlying theme of the river basin as the reference unit for the implementation of IWRM policies, has characterized all major cases of RC, even if this reference unit often involves territories which are extremely complex and diverse from a geographic, environmental, social and political viewpoint (Blonquist 2008; Grizzetti et al. 2016; Mees, Suykens and Crabbé 2017; Räsänen et al. 2017; Scaduto 2017; AAVV 2018; EEA 2018; Kuemmerlen et al. 2018).

In latest years, some scholars, experts, urban and territorial planners, and administrators have stressed also the role assumed by the ecosystem services, along with the question of the better physiographic/anthropic





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context to the spatial and administrative extent of which RC reveal to be capable to really act (Böck, Polt and Schülting 2018).

Further, in the European scenario, the capacity of RC to operate in integrated and cross-sectoral management of water resources has been clearly emerging with more effective results at the inter-municipal level, whereas RC are able to promote extremely advantageous forms of association between the different city local administrations, their communities and private stakeholders (Bastiani 2011; Iacoviello 2011; BURGEAP 2011; VOLARE 2014; UNESCO 2015; Scaduto 2017; Pappalardo and Gravagno 2018).

### 3. THE STATE OF THE ART OF RIVER CONTRACTS IN URBAN AREAS IN EUROPE

#### *3.1 The ongoing paradigm shift from reach/single river approach, towards river networks smartness against urban areas pollution, climate change threats and 'rivers segregation'*

As concerns IWRM and RBM policy, the 1990s and 2000s have been characterized undoubtedly by an actual and profound paradigm shift, still spreading in the whole Europe and World water management sector.

This 'cultural shift' has been bringing from scholars', water domain experts' and technicians', and politicians' early focus set primarily on principles of hydro-sedimentary functioning of single reach or river – that in last decades had mostly inspired water bodies restoration interventions (URBEM 2005; Bethemont and Bravard 2016; Bravard 2017) – towards river network-based and aptly renewed political and participatory approaches to IWRM and RBM policy, no longer by imposing compulsory measures dictated by central governments, but engaging more widely and deeply stakeholders and settled communities.

#### *3.2 Urban areas and water territories: critical interrelationships and potential in innovative development*

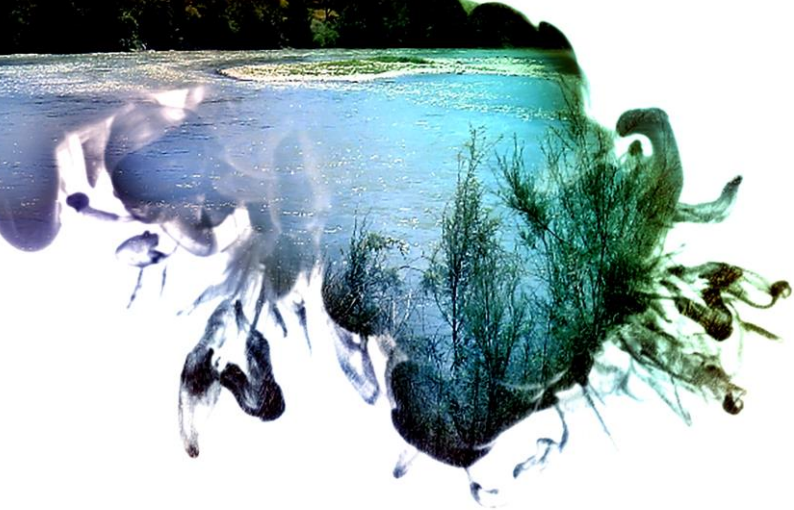
To better frame the state-of-the-art of RC diffusion and implementation in urban areas across Europe, it is deemed very useful first of all to recall crux and potential of interrelationship existing between cities and village, physiographic items of river basin and anthropic pressures on fluvial territories and ecosystems.

Up today, it is clearly evident that threats to the 'fortune' of our cities and village, both major and minor ones, and opportunities to their sustainable development and our Social Innovation are primarily identified across the World with: flood risks and other climate change-induced threats, sealed soils and surfaces in urban areas, deeply affecting the natural water cycle, urban/periurban water bodies pollution, freshwater bodies capacity and continuous availability, problematic relationships between urban areas and ecology and biodiversity aspects of urban environments (EEA-ETCICMW 2016).

Therefore, RC seem to have still many issues to cope with and many territorial players and stakeholders to make linked and interacting persistently within differently challenging urban scenarios, as it is better illustrated in the following sections.

#### *3.3 National RC inventories*

Through the background drafted in two previous paragraphs, it is clear the importance of a wider awareness and knowledge sharing of RC-based water policy implementation approaches and project up today undertaken and still ongoing, both for settled and involved communities, and other Countries across the World. In this sense, RC inventories have assumed undoubtedly an important role in sharing technical data and outcomes of RC experiences, and in transferring methodological-operational solutions between and across Countries, as well as also in analysing the state-of-the-art of WFD, IWRM and RBM real



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implementation through RC-based initiatives. Some examples of these kind of 'knowledge experience bases' are represented, e.g., by the French, Belgian-Wallonian and Italian RC inventories, as it will be better detailed within the extended version of this contribution.

In the light of the National RC inventories briefly recalled and that one set up for monitoring the WFD implementation degree at the EU level, by now it seems fundamental that an EU institutional and research network could actually structure and maintain a European Observatory on RC.

#### 4. MAIN CHALLENGES AND OPPORTUNITIES OF RIVER CONTRACTS IN URBAN AREAS

##### 4.1 River Contracts as Social Innovation processes in urban areas

RC have been demonstrating enough flexible and suitable to cope with concertation, subsidiarity principle, inter-institutional cooperation, public and private partnership, community's engagement and true participation in decision-making processes, and so on, in many different headwater, upstream and rural contexts, as well as within more complex and challenging urban areas. By now, most of critical issues briefly afore-recalled about relationship between water territories and cities and villages, can be analysed and addressed also through the perspective of the Social Innovation, intended primarily as «new ideas that meet social needs, create social relationships and form new collaborations. These innovations can be products, services or models addressing unmet needs more effectively»<sup>3</sup>.

For example, RC could offer a good conceptual and operational paradigm to be intertwined with that one of the co-creation<sup>4</sup> of new services of public interest and utility, such as new ecosystem services provision as afore-mentioned, along with achieving fundamental objectives in river physiographic restoration and renaturation, de-culverting and recovery from historical pollution issues.

The potential of RC to help rural and urban communities in re-building together upstream and downstream interrelationships, is a first significant proof of their penetration capacity in those contexts where municipalities must partake, above all, within the mitigation of all afore-mentioned risks and hazards typical of water territories, thus overcoming oftentimes too 'parochial' views in implementing IWRM policy and measures. Further, also the interrelationships between IWRM implementation initiatives at urban scale and local spatial planning programs can highlight another crucial topic for city's water strategy definition and actualization, also within which RC should assume a more advanced planning and legal-financial function towards a full achievement of WFD objectives.

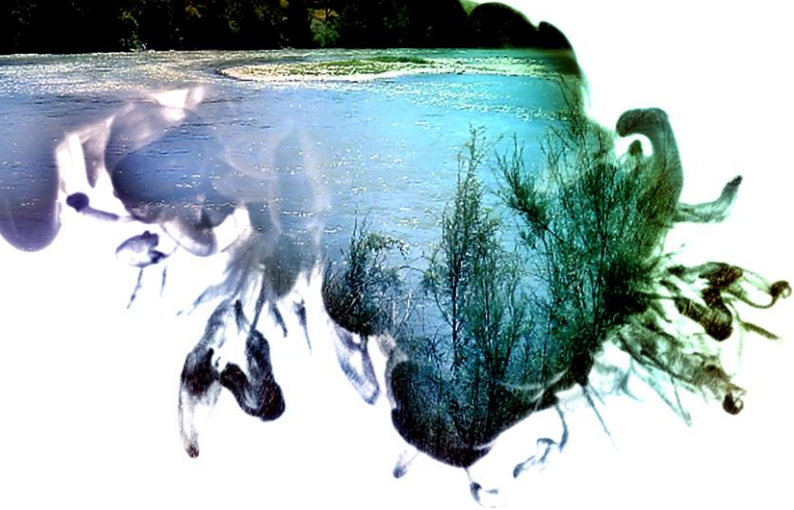
##### 4.2 River contracts and urban and territorial planning

The contemporary scenario, furthermore, determines difficult and often critical relationships between water planning and other sectoral planning actions, above all with spatial planning of European urban areas. Indeed, in many cities and villages the current layout results by now very saturated by latest decades of urban tissue expansion phenomena, often not driven by an opportune attention to ecological, hydrological and, more generally, ecosystem issues relevant to rivers and water bodies, as regards both upstream and downstream reaches and settlement zones.

Therefore, that topic of integration between water planning and spatial planning within urban consolidated tissues, as well as new growing periphery and central zones affected by re-designing programs and public

<sup>3</sup> [http://ec.europa.eu/growth/industry/innovation/policy/social\\_en/](http://ec.europa.eu/growth/industry/innovation/policy/social_en/).

<sup>4</sup> <https://ec.europa.eu/esf/transnationality/content/three-essential-steps-co-creation/>.



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and/or private-promoted planning actions, has been assuming more and more critical weight (Magnaghi 2015; EEA-ETCICMW 2016; EEA 2018; INBO 2018; Marucci et al. 2018).

Scientific and technical available literature on that topic along with the well-known case studies of RC completed or ongoing across Europe, can offer a useful starting point to better frame relationships between urban areas, water/fluvial territories, and RC and any other similar initiative started, undertaken or lasting during last decades. Within all that complex and challenging scenario of mixed methods, approaches and operational solutions, historical differences and reasons in urban tissue consolidation and evolution, physiographic binding elements, and so on, RC potential can play a fundamental role of catalyst of innovative IWRM-oriented initiatives.

Further, the analysis of the RC experiences both completed and still underway illustrates a growing trend towards integration between RC and other instruments of basin management and urban and territorial planning, even though the broad range of actions and the role taken by RC regarding the implementation of water policies at the local level, veer towards a careful reflection of the horizontal and vertical relationships that these voluntary contractual agreements are able to establish with the other planning levels. By virtue of their potential in this ambitus, RC may also take on an important connecting function between river basin plans and processes of urban and territorial planning, also in the prospects of an evolution of the latter and of a greater coherence between territorial scales on which both planning practices are based.

## 5. RECOMMENDATIONS FOR STARTING A PARTICIPATORY RIVER CONTRACT

### 5.1 For a *Vademecum* of RC designers and RC project managers

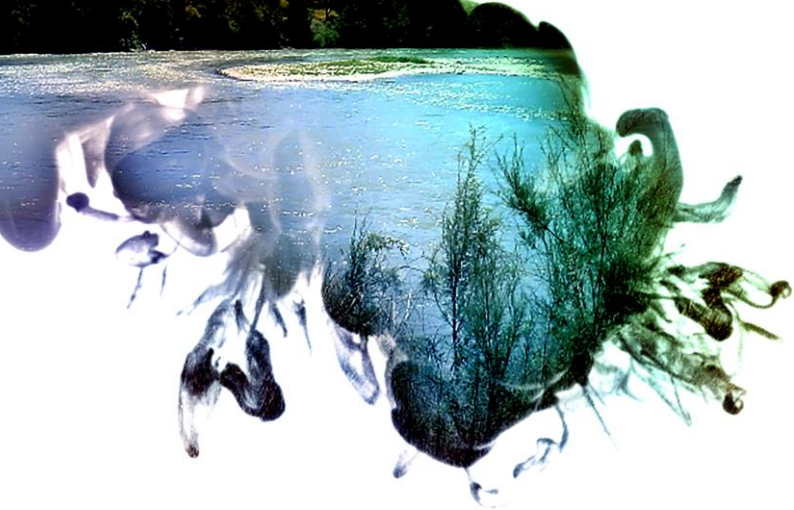
In the light of the wide and flexible potential of RC as WFD, IWRM and RBM implementation processes and politico-financial-operational instruments, by now it appears very important that a new and more unifying theoretical-technological framework could be structured and maintained at the European level. The primary aim of such an approach should be at better harmonizing and optimizing all ongoing and future RC projects, across both Europe and World, and also to ensure to them more opportunities of success on the local scale, actual transferability, opportune transboundary implementation for those hydrographic areas shared by two or more Countries or federal administrations, and, consequently, co-funding solutions based on diverse kind of financial resources and optimal integration with other sectoral planning tools.

In this perspective and starting from best practices hitherto widely acknowledged as more significant for the RC sector, a possible *Vademecum* should have to recall to each RC designer and project manager and drive them through, at least, all basic recommendations to promote, launch and initialize a RC process, until its completion in terms of socio-cultural, economic and technical outcomes, as it will be better detailed within the extended version of this contribution.

### 5.2 Concertation and participation: RC knowledge management and experience sharing systems and tools

More recently, the *International Network of Basin Organizations* has issued an entire working paper dedicated to this argument, *The handbook for the Participation of Stakeholders and the Civil Society in the Basins of Rivers, Lakes and Aquifers*, given that, as stated in its introduction, «The vagueness found in participation issues deserves to be clarified when we consider basin management. Indeed, at the level of river, lake and aquifer basins, either national or transboundary, experience has clearly demonstrated the need to design mechanisms that facilitate the participation of stakeholders and the public in river basin





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management» (INBO 2018). Aspects of cooperation between public and private player and actors of the water sector, as well as between high level government institutions and settled communities, are indeed crucial in every kind of program and action to be taken to resolve some of typical water related issues.

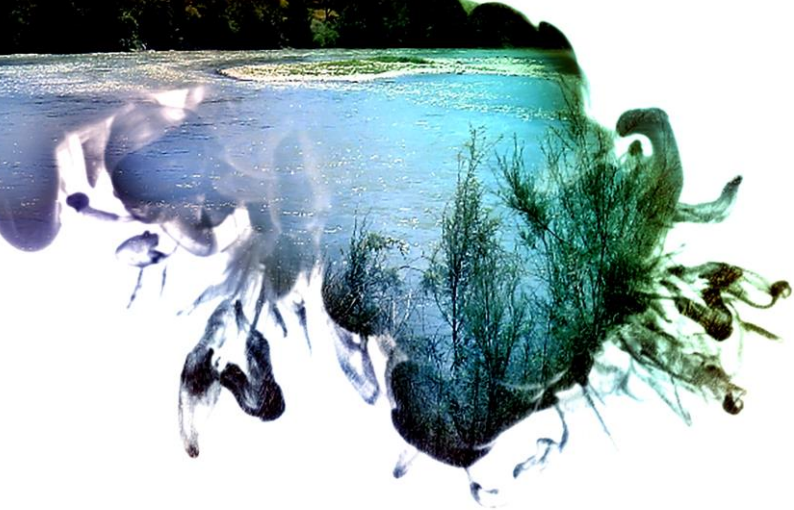
It has been clearly emerging also about RC projects – as it can be detected analysing diverse case studies through scientific and technical literature, as well as browsing the National RC inventories afore-mentioned – e.g. the specific section dedicated to sharing RC experience knowledge within the French GEST’EAU web platform<sup>5</sup>.

In this perspective, it is clear how one of the primary topic for RC designers and project managers must correspond to the setting up of a territorial information system, where possible to be integrated with social single-sign-on from the beginning, through which all players and stakeholders, directly or indirectly involved in a RC process, could access basic knowledge of the affected territory and co-create and share new scientific and informational contents, official deeds and documents, follow the RC implementation path and the fund expenditure bill, report every important issue relevant to the RC program of actions, access minutes of RC assembly and committees, and so on.

As regards the development of such a digital shared instrument of governance, designing and planning, monitoring and knowledge dissemination for RC projects, nowadays, the methodological and technological scenario offers applications of great interest and potential, for instance Public Participation GIS (PPGIS), that represent a particular adaptation of GIS-based technologies, and CAPS – *Collective Awareness Platforms for Sustainability and Social Innovation*<sup>6</sup>.

<sup>5</sup> <http://www.gesteau.fr/partage-experiences/>.

<sup>6</sup> <https://ec.europa.eu/digital-single-market/en/collective-awareness/>.



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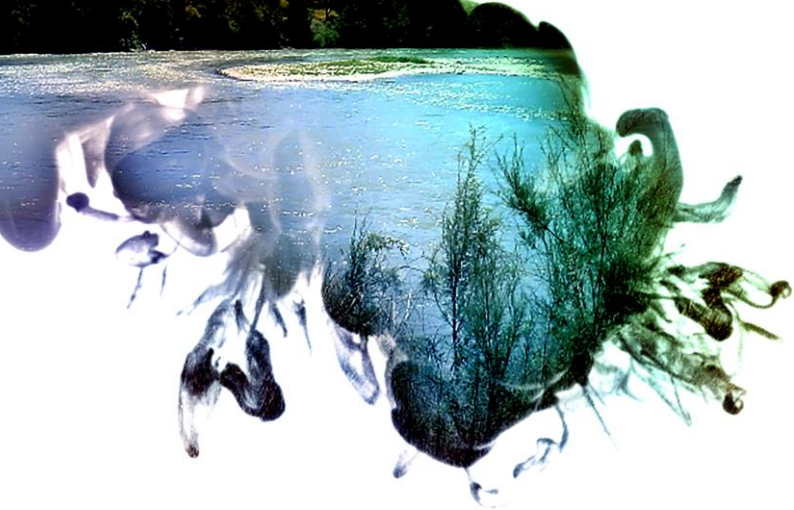
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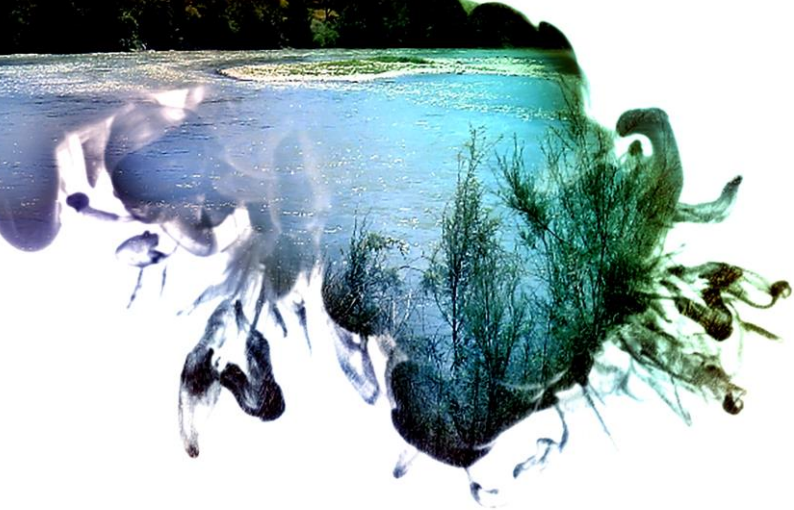
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