

Can “River Contract” Management Conserve an Ecosystem?



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Opinion

Every human action developed along fluvial corridors, in order to be effective, must take into account not only the set of naturalistic, landscape, socio-economic values of that territory, but also the rules that underlie these values. In addition, several level of management and responsibility could be overlap. Guaranteeing this integration is not always simple and not even in some cases of immediate application, for this reason, the River Contract (abbreviated as RC) can represent a solution, indeed an extraordinary development opportunity for that territory crossed by a river regardless of its size. RC is a voluntary-based inclusive tool for strategic and negotiated planning, whose main scope is the protection and better management of water resources, the enhancement of river landscape and the mitigation of flood risk, contributing to the local development [1,2]. Although there is no specific legislation on this instrument, it is inspired by Directive 2000/60/EC which prefigures systemic policies for the requalification of surface and groundwater and is implemented in the Habitats Directive 92/42/EEC, in the Directive on risk management floods 2007/60/EC and therefore in the Soil Framework Directive, with the aim of protecting the soil from erosion and pollution [1]. Compliance with these directives would allow RC to achieve its objectives and increase awareness in the local community of the choices made. In fact, the European directive of Nature 2000 overcomes the logic of administrative boundaries, in which to carry out the verification of the waters, and initiates the integrated management at the level of the hydrographic basin with a holistic and multidisciplinary vision. It introduces the ecological status of water bodies with a series of

qualitative elements to be able to classify it; among these biological elements are the decisive ones, since the hydromorphological and the chemical-physical elements “support” them.

The objectives of the same directive would be to make every river reach a good ecological status, so as to have elements of biological quality not altered, ideally by anthropic activity, in coherence also with the other elements (a “smart river” as indicated in [3]). However, this condition often clashes with the world we live in which tends to develop new uses of resources to the detriment of ecological conservation. RC could intervene through the implementation of actions, which produce concrete results that can be monitored in the short and medium term. These actions will respond to the resolution of environmental and territorial problems of a specific area, integrating and coordinating already existing plans and programs and the interests of that territory [2]. The definition of the actions would take place through a participatory process, in which experiences and skills are shared, involving citizens, groups of citizens, professionals, administrators and stakeholders [1]. For example, contributing to uncontaminated water quality with the control of discharges from industrial or urban aggregates would be an advantage for the ecosystem, but also for an increase in the quality of life of the local community. Another example to be implemented in the context of the RC could be that of flood defence. This defence is becoming no longer postponeable due to the exacerbation of the effects of climate change [2]. In this sense, the execution of passive interventions to protect against flooding such as the restoration of the riparian vegetation, the adjustment of the embankments near

the urbanized areas, as well as that of the crossing infrastructures (bridges, tombinated sections, ...). Pursuing this process under the RC must not be a reaction towards the loss of a fish species in the red list or the fear of being inundated by yet another flood, but rather from the desire to regain an identity from the waters that flow in that channel, safeguarding its physical and biological integrity.

Probably, the experience of RC carried out in a basin of limited dimensions such as that of the Rio Capodacqua - Santa Croce in Central Italy can help to understand the validity of the management of a River Contract. Such a basin with its extension of just over 35 sq km covers three municipal areas (Formia, Minturno and Spigno Saturnia). Furthermore, it is protected upstream, where the spring is located, and downstream, where it flows into the sea by two regional parks (Parco dei Monti Aurunci and Parco della Riviera di Ulisse). The same river, less than 11 km long, is included in the Natura 2000 network, with the SIC code IT6040024 due to the presence of riparian habitats typical of Mediterranean watercourses and above all by the presence of fish species of great conservation interest (i.e., Lamprey planeri, *Salmo (trutta) macrostigma*, etc.). Over time, this condition has begun to be increasingly threatened not only by water quality, but also by growing anthropic pressure (i.e., agricultural practices that disrespect the watercourse, industrial settlements with uncleaned water, recent urbanized areas not supplied by sewage services, etc.). The markedly polluted water quality in its lower stretch, the evaluation of the ecosystem both for the morphological conditions of the channel and for the reduction to a few dozen individuals of some species, the increasingly frequent floods of the water course have awakened the interest in the river. In fact, some citizens' associations alarmed by these situations have become promoters with the municipal administrations allowing the gestation of the RC. At the same time, primary schools were involved in making pupils discover the beautiful places of water within the reservoir, while secondary schools introduced their students to periodic analyses of the river waters or the arrangement of the embankment with naturalistic engineering techniques. This path started from the bottom was essentially aimed at reversing a growing degradation and the concern of not being able to enjoy a well-being built also around the river.

However, in the strategy of the RC there is the overcoming of the critical issues and the achievement of an organic vision and consequent management of the river territory with attention to the hydraulic safety and ecological protection of the river [as proposed in 3]. This is why the gradual involvement of those who administer that territory (municipalities), of those who manage the resources (e.g., the water and park management body) and of those who make a living there (e.g., industrial-artisan consortium, farms, tourism activities, etc.). For this reason, it was necessary to carry out not only a cognitive analysis of the naturalistic aspects, but also of the socio-economic ones. For this purpose, the wealth produced in the basin area was evaluated both in terms of employees and products that could even be valorised with the improvement of the state of the river. Since agriculture is the most widespread activity, an attempt was made to make the workers aware of the need to create buffer strips so as to capture the fertilizing elements and pesticides transiting from the agricultural land to the surface water body. Furthermore, the farmers themselves were invited to recover traditional and organic crops in the floodplains of the river. In addition to water quality, another critical issue emerged for the species present in Rio Capodacqua-Santa Croce, especially during dry periods: low values of the Minimum Vital Outflow. To prevent this, the body that manages the waters in the area, including the source that feeds the river, undertakes to ensure sufficient flow. The integration of many aspects improves the functional recovery of the ecosystem. In conclusion, the answer to the question posed by the title is certainly positive. In fact, guaranteeing water supply and water quality means preserving the integrity of the ecosystem, even in conditions of climatic variations that are difficult to bear. So, the instrument of the "River Contract" if it allows to ensure the necessary sustainability for future generations.

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