River restoration can greatly benefit from Citizen Science

La restauration des rivières peut grandement bénéficier de la science citoyenne

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RÉSUMÉ

La Science Citoyenne (SC) représente un point de rencontre entre la société (les citoyens), le monde de la recherche, et celui des autorités qui gèrent et restaurent le territoire. La restauration des rivières peut grandement bénéficier des opérations de SC à bien des égards, comme une surveillance approfondie, la diffusion d'une nouvelle culture de restauration des rivières, l'implication des citoyens dans les processus de prise de décision et la réduction des conflits. L'étude est située dans le bassin de la rivière Marzenego caractérisé par plusieurs projets de restauration de la rivière. Dans cette étude, une approche de co-conception avec les citoyens a été suivie et certaines activités de surveillance ont été menées comme l'étude de la qualité de l'eau et de la végétation riveraine. Les activités de CS menées ont apporté des bénéfices/impacts significatifs à court et à long terme, parmi les plus importants que l'on peut citer : renforcement de la communauté, une plus grande prise de conscience par les citoyens du territoire dans lequel ils vivent, changement de comportement individuel, augmentation de la collaboration entre les autorités et citoyens, augmenter la base de données environnementale, améliorer la connaissance holistique du territoire.

ABSTRACT

Citizen Science (CS) represents a meeting point between society (citizens), the world of research, and that of the authorities that manage and restore the territory. River restoration can greatly benefit from CS operations in many ways like extensive monitoring, disseminating a new river restoration culture, involving citizens in decision-making processes, and reducing conflicts. The study is located within the Marzenego River Basin characterized by several river restoration projects. In this study, a co-design approach with citizens was followed and some monitoring activities were carried out like water quality and riparian vegetation survey. The CS activities carried out have brought significant benefits/impacts both in the short and long term, among the most important we can mention: community building, greater awareness by citizens of the territory in which they live, change individual behavior, increase collaboration between local authorities and citizens, increase environmental database, improving holistic knowledge of the territory.

KEYWORDS

Citizen Science, Co-design Approach, Partnership, Riparian Vegetation, Water Quality

INTRODUCTION

Keeping in mind that the main objective is the protection and restoration of the environment, Citizen Science (CS) represents a meeting point between society (citizens), the world of research and that of the authorities that manage and restore the territory. This partnership in addition to obtaining mutual benefits: on the one hand greater knowledge and on the other an important help for data collection in space and time (e.g. long-term monitoring), gives rise to new ideas and awareness, reduces conflicts, finally, it creates an important motivation to “bring man closer to the river, lake and / or wetland”.

Citizen Science places the citizen at the centre of monitoring, planning and management of projects aimed at the collective good: i) involving citizens in decision-making processes, ii) enabling citizens to contribute and interface with other technical-administrative figures (e.g. technicians, politicians)

Extensive monitoring, as well as disseminating a new water culture, is necessary. CS is a journey, to take with citizens, which is indispensable for an ecological approach to river restoration and more generally for education in sustainability.

The case study is located along the Marzenego River and its tributary Rio Draganziolo within the Venice Lagoon Watershed. The Marzenego river restoration projects follow specific actions such as: protect and replant riparian vegetation, channel enlargement and reshaping, restore natural habitats, creating wetlands both within and out of the channel. In this study a co-design approach with citizens was followed and some monitoring activities were carried out such as: water quality, riparian and aquatic vegetation monitoring; with the aim of knowing the effectiveness of the restoration projects already carried out and evaluating future projects needs.

METHODS

The Ground Truth 2.0 co-design methodology (Wehn and Pfeiffer, 2020) represents best practice in the co-design of practical citizen science and is particularly suited to the context of river restoration due to the methodology's focus on the generation of "Citizen Science activities "aimed at facing future challenges on land management on the basis of a solid understanding of the social context.

To allowed to guide the implementation of citizen science activities within this case study an adapted version, called the GT2.0 co-design methodology light was used.

FWW is a global citizen science program run by Earthwatch Europe, It trained volunteers make a number of visual/contextual observations of the water body, including estimates of water depth, water flow, potential pollution sources, and presence of aquatic wildlife, as well as some basic chemical tests for nitrate (NO3-N) and phosphate (PO4-P) and an optical test for turbidity. FWW data is available for download through the website https://freshwaterwatch.thewaterhub.org/ (Thornhill et al 2019).

The monitoring of riparian vegetation is carried out with a Smartphone application (calls RiVe) still in the validation phase. The riparian vegetation survey is design to enable citizen scientists to monitor riparian habitat mosaics and human pressure by the structure of vegetation communities and index species composition and coverage.

RESULTS

The first face-to-face meeting, was held on 3rd of December 2019, most of the participants worked in groups with interest to identify the problems that directly concerned them. From this first meeting, a causal map was built (Fig.1) which was presented and discussed with citizens in the following three online meetings. During the first online meeting three different aspects of the territory to be kept under control were identified: 1) water quality; 2) biodiversity and landscape quality; 3) flood risk. It was decided to work on the first two. The other two online meetings we discussed the methodologies to be used, the timing of data collection, and the active citizens, who will also be the representatives of a group of citizens / association). These citizens, together with both secondary and primary schools, will carry out monitoring activities in sampling sites defined among those identified in the area of interest.

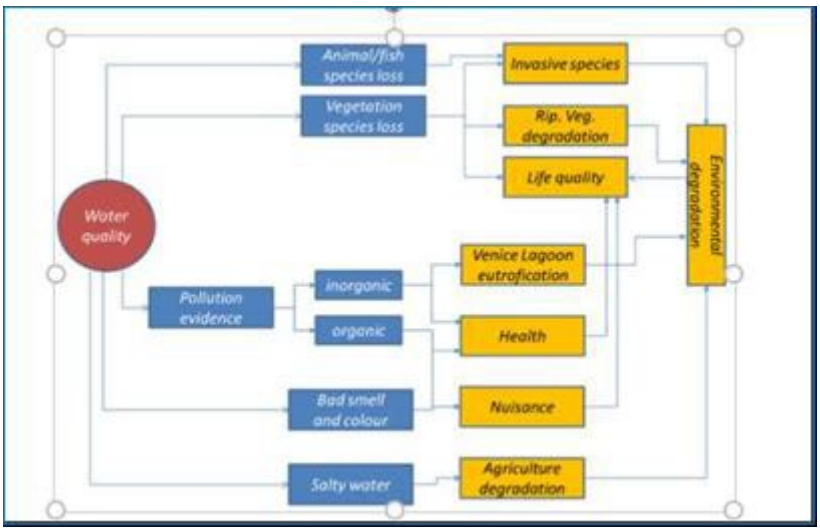

Fig.1 Causal Map from Co-design approach

From 2 of October 2020 to 23 of November 2021 about 50 citizens who participated in at least one event, about 10 active citizens in monitoring involving other people moreover 343 students, aged 9 to 18, 35 teachers and 3 technicians. 124 samples were made for monitoring nitrate phosphates and turbidity (FWW methods) in 21 sites, 20 vegetation surveys of which 15 riparian and 5 aquatic.

Conclusions

From the final consultation with the citizens was underline they found great enthusiasm in being able to work in a common project in which both citizens and schools were involved to take care and know better the territory in which they live (community building). Furthermore, the activities of CS with the co-design approach allowed citizens to collaborate also with local authorities with the idea in the future of developing a possible "early warning system" for freshwater environments. Finally, the possibility that CS activities give us to carry out monitoring with greater temporal frequency and greater spatial detail of parameters provided by the WFD but also of non-mandatory parameters such as Riparian Vegetation or non-mandatory environments such as wetlands should not be underestimated. For river redevelopment projects, it would be of great help to be able to count on both long term and pre and post redevelopment monitoring.

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LIST OF REFERENCES

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