Together4Water: Testing a Citizen Science water monitoring project in Tunisia

Raed Fehri (1), Kim Mens (2), Slaheddine Khlifi (3), and Marnik Vanclooster (1)

(1) Université catholique de Louvain, Earth and Life Institute (ELI), GERU, Louvain La Neuve, Belgium, (2) Université catholique de Louvain, Institute of Information and Communication Technologies, Electronics and Applied Mathematics (ICTM), Louvain La Neuve, Belgium, (3) Ecole Supérieure des Ingénieurs de Medjez el Bab (ESIM), UR-Gestion Durable des Ressources en Eau et en Sol, Tunisia

Citizen Science (CS) has been emerging in the last decade as a new field of environmental monitoring involving a direct collaboration between everyday citizens and scientists. The concept is now also introduced in hydrology. In Tunisia, several recent governmental efforts aimed at reinforcing the existing official water-related information through the renovation of the Tunisian monitoring systems. However, the lack of reliable hydrological data still an issue. This major point of concern can be partially addressed through a CS approach.

In this study, we present results of the test phase of the Together4Water initiative, a water resources CS project that was launched in Tunisia in 2018. We monitored river flow, rainfall and water quality in a test area of the Medjerda catchment using cost-effective and/or public available sensors. For river flow we used the 'Discharge app', for rain simple manual pluviometers and for water quality simplified water quality strips. We used a step-by-step approach to target, to engage and to train citizens on using the monitoring tools and transmitting the data to a centralized online platform. The collected CS data are compared with data from the governmental reference stations. Preliminary results yield a good agreement between CS river flow data collected at two sites (Slouguia and Medjez) and the reference stations (correlation coefficient R ranges between 0.8 and 0.97 for all citizens). For rainfall, measurements collected by citizens in eight locations correlate well with reference data (R ranges between 0.95 and 0.98). Finally, CS water quality data (PH, NO_3, NO_2, KH, GH and Cl2) are also consistent with the laboratory measurements (R ranges between 0.75 and 0.8). In addition, uncertainty of the CS data are compared with the uncertainty associated with the official governmental data. We conclude that the Together4Water CS test phase delivered a consistent hydrometrological data set. The variability between the citizens' measurements can be explained by many factors such as the location of pluviometers for rainfall observation, the wind and light reflection for river flow measurement using Discharge app, and colors identification for the water quality strips. The CS approach is considered promising to complement existing Tunisian monitoring systems, and also to enhance innovation, adaptation, and local capacity building in the Tunisian water sector.