

To effectively reduce the agricultural impact on the aquatic environments, the cause-effect relations between agricultural practices and water quality should be well understood. In that conditions, environmental Indicators are often used since they can display in rather simple terms some complex environmental phenomenon variation. Yet, the selection or the creation of the best indicator to explain a phenomenon could be challenging.

In the FAIRWAY (Farm systems management and governance for producing good water quality for drinking water supplies) project, we focused on the identification of indicators in order to quantitatively and conceptually show the relationship between agricultural practices (driving forces and pressure indicators) and drinking water quality (state indicators) that could be used in the European Member States. Hence, our main objective was not to create new indicators but to assess the link between indicators.

The objective of this study is to determine how indicators of pressure and of state i.e. water quality can be linked to assess the efficiency of mitigation measures using common European indicators. First, we conducted a survey among the FAIRWAY case studies to identify indicators, then statistical tests were performed between selected indicators of pressure and state for both nitrate and pesticide. We examined 1) the link between indicators, and 2) the relevance of some indicators, as statistical calculations give the mathematical expression for the link that exists between them. The tests reveal two assessments.

-Firstly, the lag time between contaminant emission and environmental impacts should be assessed. Cross-correlation appears to be a promising method to tackle it, but this method is not applicable on every site generally because of the lack of appropriate data.

-Secondly, the determination of European indicators is not trivial. Despite common regulatory drivers at the European scale, the calculation of indicators is highly flexible across Europe. This flexibility appears during collect, storage or dissemination of input data from the Member states. Harmonized practices in term of data collection is needed and once information is acquired it is essential that it is made available using FAIR (Findable, Accessible, Interoperable, Reusable) principles to all the potential users.

Today, as implementation of regulations have been country-specific, the uniform application of data-driven indicators of pressure and status indicators across Europe remains challenging.