Agri-drinking water indicators (ADWIs): Linkage between agricultural practice and good drinking water quality

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To effectively reduce the agricultural impact on the aquatic environments, the cause-effect relations between agricultural practices and water quality should be well understood. For this purpose, models are frequently developed, in order to establish a link between agricultural input and the output in terms of water quality and quantity. However, the establishment of models represents a fairly large challenge as it usually includes the consideration of numerous processes. Efforts to make it as precise as possible most of the times lead to rather complex models, for users hard to understand. Indicators are intended to fill the gap between no information or too detailed information, displaying in rather simple terms what could have an effect on environment.

In the FAIRWAY (Farm systems management and governance for producing good water quality for drinking water supplies) project, therefore, we focus on the evaluation and prioritization of indicators that quantitatively and conceptually show the relationship between agricultural practices (driving forces and pressure indicators) and drinking water quality (state indicators), named 'Agri-Drinking Water Indicators' (ADWI). The focus is on drinking water pollution due to nitrates and pesticides.

As starting point, we conducted a survey among the 13 FAIRWAY case studies to identify those driving forces and pressure indicators, which are already in use as ADWIs. We accomplished the survey by a literature review. A first prioritisation resulted in a list of possibly applicable agricultural indicators (driving forces and pressure indicators), which are based on existing or easy to acquire data at the European scale. State ADWIs are relatively well standardized among the case studies.

A classification of the hydrogeological systems was established and link ADWIs were introduced in order to categorize the dominant pathways and quantify the lag time between agricultural practice and drinking water pollution. The link ADWIs were identified dominantly in scientific literature, mainly because they have not been actively used in practice.

In a next step, correlation tests already established between agricultural and state indicators will be carried out in order to evaluate all potentially useful indicators and with available data from all FAIRWAY case studies.

In a final evaluation step, the acceptance of the deduced set of indicators will be tested among target users in the case studies (i.e. farmers, agricultural advisors, policy makers).

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