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Qualifying agriculture in areas affected by pesticide water pollution: an information system to help water managers in designing and monitoring agro-environmental action plans

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Abstract: Water quality is still getting worse, despite decades of public policy attempting to reverse this decline. Agricultural activities have been identified as a main source of diffuse pollution by pesticide. Therefore, qualifying the current and future agriculture is a major concern for water managers and decision makers: pesticide products used with varying chemical contents generate transfers of pesticides to freshwaters and potentially hazardous residue. The aim of our study is to analyse key stakeholders involved in the decision process to implement environmental action plans, how they use (or not) thematic and spatial available information and to propose a helpful information system for public action. To achieve a more “enlightened” form of governance, information needs to be better spatialized, more structured and relevant for the scale of action. It needs to take into account the ecological and social context of the area. The methodology includes interviews and document analysis to identify thematic and spatial information used as part of pesticide reduction programs. We also look for links between different members of the institutional network and model them using UML (Unified Modelling Language) diagrams. Then, based on this network analysis and taking in account the needs of managers, we propose a stakeholder-oriented information system (using data warehouse technology) to estimate the environmental impact of current agriculture and potential actions. Several cubes and axes of analysis allow providing chosen indicators at different levels of aggregation and for several dimensions e.g. time, spatial scales or pesticide type. The project involves supporting an action plan for the “BAC Coulonge” water supply area (SW France), which covers some 260,000 hectares of crops and vines.

Keywords: pesticide action plan – institutional mapping – data warehouse – environmental indicators.