



Sustainable water quality management of agricultural diffuse pollution at catchment scale for the implementation of the EU Water Framework Directive

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There are gaps between the current researches and the implementation of the EU Water Framework Directive in the water quality management. Water pollution prevention at catchment scale is more important and more feasible than remediation of polluted water afterward. The impact of agricultural diffuse pollution is not uniform across the Europe due to significant situation varying between catchments on land use, climate, agriculture activity, soil, topography, hydrogeology condition and the sensitivity of particular water bodies to pollution.

This paper presents a catchment scale based method for both groundwater and surface water quality management to prevent diffuse pollution from the agricultural sources. This method provides decision-makers with the information of the mechanism and understanding of catchment water diffuse pollution using numerical model based on catchment specific situations and calculation of the catchment groundwater diffuse pollution risk. Before local government makes the final water quality prevention decision at one area, this method can be also used to evaluate the impacts of the proposed plans on both surface water and groundwater quality. The method was applied in the Upper Bann Catchment, Northern Ireland. Application of the method shows that the spatial management of the water quality can provide useful and robust support for the implementation of the EU WFD in the near future. This method can be transferred to other catchments for pragmatic water quality management in a sustainable manner, and is suitable for all solutes in groundwater and surface water from agricultural diffuse sources.