

Assessing the composite risk of river contamination – perspectives, problems, methodology

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Surface waters play in Japan a major role for the water supply. Over 70 % of the used water in the households and industry is taken from rivers or lakes. Possible contamination of rivers is affecting not only the water supply; an additional threat is given by farming besides facilities dealing with hazardous substances. This is caused by the heterogeneous land use in the study area of Nagoya. In addition came the rivers in the past years more and more important for recovery or free-time activity. Objectives of directives, policies and regulations in the past years were to prevent further deterioration of the water resources, to promote sustainable water use and to reduce discharge of pollutants and hazardous substances into the surface waters. They were focusing mostly on high frequency events or continuous releases into the water system. Low frequency-high impact events like inundation or accident-triggered releases of contaminants from facilities were not considered in these policy frameworks. To improve the contribution of valuable information to stakeholders and decision makers this study is presenting a diagnosis framework for the analysis of possible contamination of surface waters under consideration of disasters. The first step for a diagnosis framework as it is understood by the authors is to establish the context: Analysing the risk leading to contamination of rivers for receiving structured information for stakeholders and decision makers under consideration of recent public available data for the study area. The presented, available data allow to answer the following questions: a) Which sites/facilities build a threat because of the release or handling of hazardous substances?, b) What kind of threat is given

by a site/facility dealing with hazardous substances and leading possibly to contamination (accidents, flooding, drought, site specific characteristics, like the location in a flood plain)?, c) What is the probability of the risk of releasing hazardous substances and the probable volume of a release of an contaminant ? and d) Have past regulations an impact on the quality of the rivers?.

Considering the available data to answer these questions three analysis steps within the diagnosis framework are presented reflecting local, regional and spatial temporal analysis techniques for the analysis of the risk of contamination to rivers in Nagoya area, the current study area. Based on these techniques it is discussed how valuable information to stakeholders can be distributed allowing them to act with specific measures on the threat. The role of participation of stakeholders within the decision making process for the measures against the risk of contamination is influencing the structure of information given to them. Finally some possible measures based on the presented analysis of the situation in Nagoya area are given. This diagnosis framework can be integrated into an existing Water Basin Management.