The Assessment of Freshwater Regulating and Supporting Ecosystem Service following Chemical Accidents in Korea: Using InVEST Sub-models

Myeong-je Kim, Jieun Ryu, and Seongwoo Jeon

Korea University, Environmental Science & Ecological Engineering, Lab of Environment and Policy Studies, Seoul, Korea, Republic Of (jfyoucn@naver.com)

Ecosystem service is the various benefit supported by ecosystem both directly and indirectly to human being, and there is a growing movement of its effective management. It has been getting important to quantify and evaluate freshwater ecosystem service in order to secure water supply and conserve biodiversity in light of water management. Growing amount of chemical accidents is one of the key factors to threat quantity and quality of the ecosystem service. It is, however, not common to clearly identify causality of influx of chemicals and health of water ecosystem. And it is of importance to accurately understand the change of ecosystem service, affected by external impacts. So, it has been studying in various aspects of index development and evaluation of water ecosystem service. But it needs to be discussed more on index representativeness and policy usability, and it has little achieved on the change of water ecosystem service following chemical accidents. Therefore, this study is to evaluate the change of freshwater ecosystem service before and after chemical accidents, and to predict when it would be fully recovered to the previous level. Among several models, Integrated Valuation of Ecosystem Services and Tradeoffs(InVEST) is useful to quantify and map out the ecosystem services, as it could run several sub-models at the same time and evaluate them comprehensively. Using sub-models like Habitat Risk Assessment in InVEST, this study has tried to simulate, quantify, and map out the change of freshwater ecosystem services on the rivers and streams around main industrial complex in Korea. Not only the chemical accidents already occurred, but several diffusion scenarios of chemicals related to the accidents have been applied to predict its changes. And the results are expected to be used as objective data as it could help make conservation plans of freshwater ecosystem or to newly construct industrial complex around the rivers and streams.