On the transferability of flood damage models for agriculture

Anna Rita Scorzini, Daniela Molinari, and Alice Gallazzi

Politecnico di Milano, Dipartimento di Ingegneria Civile e Ambientale, Milano, Italy (annarita.scorzini@polimi.it)

Despite the continuous growing interest in flood damage modelling, the estimation of flood losses to agriculture has not received as much attention as other sectors (e.g. the residential sector), which results in the lack of tools for flood damage estimation in many geographical contexts The transfer or adaptation of existing models is an option for these contexts, especially when data for model derivation are few or not available. Still, transferability is challenging as flood damage to agriculture is very sensitive to the geographic location of the study area.

This study focuses on the transferability of existing crop damage models to the Po Valley, in northern Italy. Existing models are generally expert-based and take into account several damage influencing parameters, including: water depth, flow velocity, inundation duration, presence of sediments and season/month of flood occurrence. However, even for the same crop type and hazard characteristics, flood losses can vary significantly depending on local climate, crop calendars, cultivation types and agricultural rotations, as well as yields and market prices. This kind of information has been collected for the Po Valley in order to identify "homogeneous" regions worldwide, for which damage curves are available. This process, combined with a sensitivity analysis, allowed to adapt existing flood damage functions for crop loss estimation in the study area.