

*Abstract*

The role of science in environmental resources management is to develop appropriate methods to transform “raw” data into relevant information in order to improve the understanding of environmental processes and to support decision-making. Innovative approaches are required to fill data and information gaps and to deal with the associated uncertainties. Two methods, knowledge integration and modelling, were developed and applied in the frame of this thesis.

The knowledge integration case study uses qualitative and quantitative information to enhance a technically-based soil salinity monitoring and assessment system in the lower Amudarya river basin in Uzbekistan. It integrates technical and local knowledge on soil conditions and management practices.

A framework to develop a synthetic rainfall-runoff database was the result of the flood risk assessment case study. The database can be used as an effective tool to assess possible streamflow situations in data-poor catchments.