

MODELLING SOLUTE TRANSPORT IN SHALLOW GROUNDWATER USING COMSOL MULTIPHYSICS

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ABSTRACT

In this day and age, pollution of the world's environment is becoming a pressing issue. In particular, water is developing into a precious commodity in both poor and rich countries.

The management of water and waste is an issue that encompasses many different forms; from contaminated clouds, to river systems and underground water tables. For example, water contamination within the densely populated lowlands fringing Kampala (Uganda) threatens the health and livelihood of uncounted thousands of inhabitants. With no formal infrastructure of almost any kind, residents of these reclaimed wetlands drink contaminated water from open springs. Mathematical modelling is an important tool in investigating and quantifying the issue that may otherwise be unreasonable to do using experiment and other analyses.

COMSOL Multiphysics, due to its versatility and flexibility, is the perfect tool for this type of modelling. With it, you can couple the transport phenomena, whether it be surface or subsurface flow, to the diffusion mechanisms that describe the transfer of waste. COMSOL Multiphysics is also a useful tool for the optimization of water purification units.