Simulation of non-point sources of pollution in upper Pangani river basin

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This is a study aiming at establishing whether or not agricultural activities using artificial fertilizers drain pollutants into streams and rivers in the catchment areas and beyond. An area of intensive irrigated agricultural region in the catchment areas of river Pangani tributaries was chosen for experimentation. The application of fertilizers containing Nitrogen and Phosphorus as plant nutrients may have side effects causing health problems such as stomach cancer and blue-baby syndrome. This study used water quality data collected from previous studies to check the potential of contamination by using the QUAL2E model after the WMS – HSPF model had failed due to its technical inapplicability in the area. The Upper Pangani River basin was divided into two sub-basins; Kikuletwa and Ruvu. The QUAL2E model was only applied to Ruvu sub-basin to assess the potential of contamination and for the Kikuletwa sub-basin. The data from previous studies were used to check the extent of pollution. The QUAL2E model for the Ruvu sub-basin was used to simulation results, the amount of non-point source load reaching Ruvu river was found to be 7857.81tons/yr for nitrogen and 12057.39 tons/yr for phosphorus. The result of the QUAL2E model suggest that there is pollution at upstream rivers as a result of application of fertilizers in the irrigation activities. These are the main sources of non point pollution, and hence the need to monitor the pollution agents.