B-26: Identification of non-point source pollution through field measurements

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Unlike the pollution from localised obvious sources, Non Point Sources (NPS) of pollution are spatially diffused and are difficult to identify and manage efficiently. Sediment, fertiliser, pesticides, salts and trace elements are

considered as NPS pollutants. The pollution potential of the different storms are also found to be varying considerably. The objective of this study was to identify the status of pollution in Nilambe Oya catchment through field measurements. The data were collected during January to May 1997. The sand and silt fractions of sediments were measured in the suspended and washloads of the river throughout this period. The nutrient pollutants measured were Nitrogen and Phosphorus and in addition, Chemical Oxygen Demand (COD).

The relationship between sediment yield and the size of the storm can be expressed by the regression model $S_Y - 0.0006\ S^{3.7}$ with $r^2 = 0.9922$ where S_Y is the sediment yield in metric tons and S is the storm size in mm.. The sediment production of the catchment increases slowly with smaller storms and a drastic increase can be seen for storm sizes larger than 50 mm.. Storm size against total Nitrogen in sediment gives a linear relationship as per the regression model $N_Y = 0.0038\ S - 0.117$ with $r^2 = 0.9038$ where N_Y is the Nitrogen in sediments in kg/ha. The phosphorus provides the regression model such that $P_Y = 0.0037\ S - 0.12$ with $r^2 = 0.91$. The most interesting relationship was found with total COD concentration in sediment and storm size. The total COD content increases up to the 70 mm storm size and then becomes stable. COD production does not respond much to the increasing storm size beyond 70 mm.

Analysis of sediment yield and Nitrogen. Phosphorous and COD as water quality parameters provides insight to the NPS pollution dynamics of the catchment environment. The pollution potential is very low when the total rainfall is uniformly distributed over time. Catastrophic events can cause severe NPS pollution in the catchment. While all the other parameters show an increase with increasing storm size, COD seems to stabilise and remain constant. These water quality parameters are needed to estimate for different land management practices in order to find the best management practices in terms of NPS pollution.