Arable farming practices and their implication on water quality in East Bukhayo, Busia district

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Abstract:

Arable farming practices such as use of inorganic fertilizers, planting poor cover crops, row planting, cultivation of wetlands and riverine areas and lack of soil conserving farming have been associated with poor stream water quality found in catchment areas where they are practiced. Increase of these practices in East Bukhayo prompted the following question, which this study sought to answer: Do arable farming practices have significant implications on stream water quality? Ten streams with sources and confluences in East Bukhayo Location of Busia District were sampled. Water samples collected from the source, middle and confluence of each stream, twice in the wet and dry seasons, were analyzed for the concentrations of phosphate-phosphorus, nitrate-nitrogen and suspended sediments. An interview schedule was used to interview farmers, while an observation checklist was used to record farming practices and aspects of water quality observed by the researcher. Relationships between practices and aspects of water quality were determined using correlation coefficients, while differences between farming practices and aspects of water quality were determined using Chi-Squared. Descriptive statistics, i.e. averages and percentages were also used to analyze the data. The findings of the study indicated that although no strong relationship exists between use of inorganic fertilizer use and nutrient concentration in streams, there is a strong relationship between inorganic fertilizer use and eutrophication. Nutrient concentrations were found to be generally lowered than the levels recommended by the World Health Organization (WHO). Stream portions in cultivated wetlands and riverine areas showed no significant difference in eutrophication from those with the same areas uncultivated. Planting poor cover crops and planting crops in rows were found to be strongly related to sedimentation, while streams in areas with soil conserving farming practices showed significantly low sedimentation level compared to those without these practices. The conclusions arrived at were that: use of inorganic fertilizer may not be directly associated with the nutrient concentration but may be associated with eutrophication; planting poor crops, row planting and cultivating wetlands and riverine areas contribute to sedimentation of stream water, although wetland and riverine cultivation does not, on its own, significantly influence sedimentation and; soil conserving farming practices do not lead to clear stream water but they help in reducing the turbidity of stream water. It was recommended that the use of inorganic fertilizer should be minimized and instead, farmers should be encouraged to use organic manure. Planting of good cover crops, broadcasting, and controlled cultivation of wetlands and riverine areas should be encouraged. Extension officers and environmental officers should be involved in advising and educating farmers on how to manage their land, prudent use of fertilizers and, the risks paused by washing clothes, bathing and watering domestic animals at the stream.