

EFFECT OF FERTILIZER APPLICATION IN UP-COUNTRY TEA LANDS ON DOWNSTREAM POLLUTION

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This study was conducted to assess the effect of application of fertilizer nutrients on Up-country tea lands and their losses to the downstream, especially during two-monsoon periods on water quality. The published information available on long term monitoring of water quality owing to fertilizer inputs in tea lands is rather scanty. Therefore a comprehensive study on this subject would be beneficial for the tea industry and the community.

The study area is located in Agra – Kotmala oya region that originates from Horton plains and flowing through several tea estates. Water samples were collected at regular intervals from 24 sites and analyzed by flame atomic absorption spectrophotometer, flame photometer, automated segmented flow analyzer and titrimetric methods for chemical parameters viz. NO_3^- , SO_4^{2-} , Cl^- , Ca^{2+} , Mg^{2+} , Na^+ and K^+ .

The concentrations of above chemical parameters were relatively lower than the standards set by WHO for drinking water. This indicates that the loss of nutrient from tea lands has not posed any significant threat to the water quality of downstream. However, it was evident that compared to the beginning of the stream, the concentration of all these parameters increased with distance in the downstream. It was also found that these parameters in natural environmental conditions in the jungle were much lower and in an equilibrium.

Based on the results, the area under study could be categorized into four main groups as (a) jungle, (b) tea, (c) tea with low anthropogenic activity and (d) tea with high anthropogenic activity. The chemical parameters showed stable, slightly variable, and highly variable in these groups from (a) to (d). This indicates that unlike in jungle, point source pollution due to anthropogenic activities such as unsystematic vegetable cultivation and sewage discharge into the streams causes increase the concentration and variations in the tested chemical parameters much more significantly, than the influence from fertilizer applications in tea lands.