Citizen science water quality monitoring: Evaluating spatial and temporal changes in turbidity in a Tropical Forested Landscape of Kenya.

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Tropical forest ecosystems have been subject to disturbances which vary through time and space due to land use changes linked to increasing population and global climate change. As a result, in many regions of the tropics where agricultural activities dominate, soil erosion and sediment-related problems due to soil loss from agricultural lands have become a major environmental problem impacting the ecological functioning of the catchments. However, in developing countries like Kenya, where changing in sediment yields might, in particular, be expected, any attempts to investigate the current trends in the sediment loads in catchments, is frequently hampered by lack of available data and records of appreciable length as there lacks long term monitoring programmes.

In an effort to overcome challenges in water quality monitoring and data scarcity, a participatory citizen science approach was initiated in Sondu river basin which originates in the South West block of Mau Forest Complex. Currently, 6 sites are being monitored for turbidity as a surrogate for suspended sediment concentration. At each monitoring site, three trained citizen scientists take turbidity measurements twice per week using turbidity tubes and send a text message via their phones to a central database.

Preliminary results indicate that the value range recorded for turbidity data during the monitoring period is between 5 and 50 NTU during low and high rainfall, respectively. A comparison between data collected using turbidity tubes and portable sensor revealed a strong linear relationship ($R^2 = 0.95$). This study aims to develop a large dataset that can be used to evaluate spatiotemporal dynamics of sediment loads based on turbidity responses, as well, demonstrate citizen science as a cost-effective means of maintaining the integrity and sustainability of the water resources.