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Impacts of land-use change on the water quality of the main source of pipe borne water for Kumasi, Ghana (A case study of the Barekese reservoir catchment area

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The Barekese reservoir provides 80 percent of the total public pipe borne water to the Kumasi metropolis and its environs. However over the past two decades its watershed has seen persistent degradation through anthropogenic activities along its catchment area which also raises concern on the deteriorating water quality. The study identifies the main land-use changes along the catchment area and assesses its impacts on the reservoir's water quality. Data was extracted from three cloud-free LANDSAT Thematic Mapper images obtained in 1973, 1986 and 2003. Questionnaires were administered in seven communities along the catchment area. From 1973 to 1986 the closed forest decreased by 43.54% whereas the open forest increased by 52.91%. From 1986 to 2003, the open forest decreased extensively by 55.25% resulting in more grassland and open area/towns. Unsustainable agricultural practices, bushfires, deforestation and encroachment of the reserve as a result of rural poverty and weak institutional mechanisms are the factors responsible for the degraded water quality and quantity of the reservoir.