

Quality assessment and social impact of water from two Mozambican rivers for human consumption and irrigation

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Although possessing many rivers, various African countries, concretely Mozambique, still struggle beyond the scarcity of proper water. It has become imperative to protect and conserve the water not only as a resource for their present uses but also for their prospective uses, with priority to surpass the risks to the health taxes of the local population living along the rivers. Usually these people use untreated water from the same point of the river for domestic consumption, livestock watering, fishing, irrigation, washing, bath and recreational purposes so developing in this way pollution and contamination. This human behaviour is preceded by direct draining of sewers and metallurgic industrial wastes, having as consequence the prevalence of epidemiologic illnesses.

The present work fits in the efforts of the Engineering Laboratory of Mozambique in partnership with Eduardo Mondlane University, for monitoring water quality for human consumption and irrigation. In an attempt to call the population's conscience and responsibilities of the great industries, this study focus

on Incomáti and Umbelúzi rivers which are the most used by the population of Maputo, a strategic province in Mozambique due to its high population density, industrial and agricultural activities.

Samples were randomly selected and collected with plastic material, in 3 points of each river (in the off-shore and in the middle) for the determination of physic-chemical parameters. Parameters such as NH_4^+ , NO_3^- , NO_2^- , temperature, TDS, conductivity and pH were measured in situ. For the determination of other parameters the following analytical techniques were used: volumetric (COD, Cl^- , HCO_3^- , CO_3^{2-}), FC (Na, K), FAAS (Ca, Fe, Mg, Zn, Cu) and gravimetric (SO_4^{2-}).

The accuracy of the methods was controlled with the river water certified reference material GLG6019 and the precision of the methods was in general good, with 95% of confidence.

The comparison of the experimental results with the limits established by the Mozambican, FAO and the OMS guidelines, had shown that all the studied pa-

rameters (with exception of the high values of K^+ and CO_3^{2-} for irrigation purpose and Fe, turbidity for human consumption) satisfy the water quality criteria recommended by the 3 norms.

High values of carbonate in water for irrigation purpose may affect the soils permeability because these ions can react with calcium and magnesium in the soil to form insoluble calcium carbonate and magnesium carbonate. The high amount of Fe together with turbidity, give a taste and coloration to the water making it improper for human consumption and for irrigation purpose.

Even knowing the risks associated with the use of this water for their daily activities, the population continues with their routine activities, with no intervention from the government authorities that alleges lack of financial resources for water treatment, and only appealing for its rational use.

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