Rehabilitation Proposal for a Rural Settlement Affected By the Fundão Dam Tailings (Mariana-Brazil): A Study Case

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Abstract - The rupture of the Fundão dam in Mariana (Minas Gerais State, Brazil) spilled the tailings across the Doce River basin, whose main toxic compounds were sodium and ether-amine, severely affecting the vegetation and soil biota. These tailings with elevated sodium and ether-amines-ammonium contents reached several towns across the Doce River basin, such as Ipaba. In this study, we confirmed the highest levels of sodium and ammonium in riverine settlement sites at Ipaba, that may have compromised crop production and fishing activities. Previous results showed that the remediation of such toxic compounds, as well as the recovery of soil fertility, plant growth and agricultural production, may be feasible if adequate and goal-directed management procedures are employed. In addition, Ipaba settlements have faced the deleterious effect of flooding containing contaminated sediment on their cropping areas. In view of the key role of riparian buffer forests to remediate toxic compounds and also to protect cropping sites against flooding, we propose a sustainable rehabilitation plan for the settlements areas affected by the Fundão dam tailings based on: 1) the creation of a riparian forest under buffer zone systems to protect the riverine settlement sites; 2) the application of remediation strategies prior to forestry management and cropping activities in order to alleviate the dam tailing toxicity; 3) the creation of a technical training school and an association of settlers to provide them with knowledge, skills and self-sufficiency for the implementation of such rehabilitation plan. This study will hopefully aid settlers to properly manage their lands in a post-disaster scenario.

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