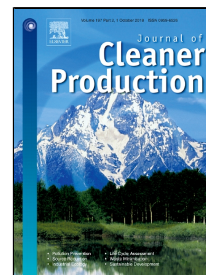


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Integrated life cycle assessment of improving saline-sodic soil with flue gas desulfurization gypsum

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1 **Integrated life cycle assessment of improving saline-sodic**
2 **soil with flue gas desulfurization gypsum**

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15 **Abstract:** A large quantity of flue gas desulfurization gypsum (FGDG), a by-product of
16 removing sulfur from combustion gases in coal-fired power generation plants, was produced
17 in the world. Improving saline-sodic soils with FGDG is one of the effective ways to utilize
18 FGDG. However, the use of FGDG has severe impacts on the environment. With growing
19 application of FGDG for improving soils, there is an increasing necessity to analyze the
20 environmental impact on the entire agricultural application process. Life cycle assessment
21 (LCA) is useful for comparing the potential risks of different environmental impact
22 categories and stages. Traditional LCA methods have some limits in comparing various
23 schemes, while the Technique for Order Preference by Similarity to an Ideal Solution
24 (TOPSIS) has its unique advantages in multi-objective decision-making. Therefore, this
25 study identified and compared the environmental impacts of four alternative schemes in
26 three stages using LCA combined with TOPSIS. In this study, the environmental impact of

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