

EGU22-2318

<https://doi.org/10.5194/egusphere-egu22-2318>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Technosols derived from bauxite residue tailings for effective revegetation and rehabilitation

Ronan Courtney

Limerick, Bernal, Biological Sciences, Ireland (ronan.courtney@ul.ie)

Bauxite residue, the by-product produced in the alumina industry, is generated at an estimated global rate of approximately 150 million tonnes per annum. Currently, the reuse of bauxite residue is low (≈2%), and consequently the bulk is stored in land-based impoundments.

If not adequately managed, exposed residue may be prone to dusting, wind and water erosion and can contaminate surrounding areas. Establishing vegetation covers (rehabilitation) is viewed as an effective strategy for mitigating against pollution risk and approaches used can be broadly divided into capping with inert soil material or establishing vegetation in the tailings surface (revegetation). Revegetation provides a strategy where topsoil material is scarce and avoids the sourcing of large volumes from other sites.

While bauxite residue is typically alkaline (pH 10-12), saline and lacking in nutrients the implementation of effective rehabilitation strategies can promote favourable soil conditions for plant growth. Results also show establishment of soil microbial communities and soil faunal activity. These positive rehabilitation effects are maintained for several years and demonstrate that residue can be transformed to a soil-like medium capable of supporting ecosystem function.